

Internet, watch television, listen in real-time to the radio and, similarly, expand the maritime communications options for government operators.<sup>49</sup> Furthermore, ESVs can assist in the processing of information between the cruise lines and the Department of Homeland Security (United States Customs Service and Immigration and Naturalization Service) as cruise ships enter U.S. ports.<sup>50</sup> Although many of the vessels on which ESVs are deployed currently are foreign-flagged cruise ships, most of the passengers on those ships are United States citizens who would benefit from having access to broadband services such as e-mail and the Internet.<sup>51</sup> Many of the cruise lines that would benefit from these proposed rules are U.S.-based companies and ESV network operators, such as MTN.<sup>52</sup> Establishing a licensing procedure for ESV networks would also advance our continuing effort to maximize the flexible use of the radiofrequency spectrum for earth station operations.<sup>53</sup>

24. In this *Notice*, we propose to amend the U.S. Table of Frequency Allocations and Part 25 of our rules to permit blanket licensing of ESVs in the C-band and in the Ku-band.<sup>54</sup> We agree with the *NOI* commenters who state that the current system of repeatedly granting ESV operators limited, six-month STAs places an unnecessary administrative burden on operators and on the Commission, and casts too much regulatory uncertainty over both ESV providers and FS operators.<sup>55</sup>

25. We agree with Intelsat that STAs are not a long-term solution for addressing the licensing requirements of ESVs. We therefore, tentatively conclude that we should adopt a licensing procedure for ESVs operating in the Ku-band. In the C-band, we seek comment on two possible licensing approaches for ESV operations. The first approach would provide a two-year license for C-band operations on a

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<sup>49</sup> SIA Comments at 1-2.

<sup>50</sup> According to MTN, approximately 143,000 passengers and 67,000 crew members are on board ESV-equipped cruise line vessels at any given moment.

<sup>51</sup> Approximately 82 percent of the passengers on board ESV-equipped vessels are United States citizens. MTN Comments at 7.

<sup>52</sup> MTN uses a teleport located in Holmdel, N.J., as its core hub for communications services. MTN Comments at 4.

<sup>53</sup> See *Principles for Reallocation of Spectrum to Encourage the Development of Technologies Telecommunications for the New Millennium*, Policy Statement, 14 FCC Rcd 19868, 19870, ¶9 (1999) ("In the majority of cases," the Commission noted in 1999, "efficient spectrum markets will lead to use of spectrum for the highest value end use," and "[f]lexible allocations may result in more efficient spectrum markets."). See also, *Amendment of the U.S. Table of Frequency Allocations to Designate the 2500-2520/2670-2690 MHz Frequency Bands for the Mobile-Satellite Service*, First Report and Order and Memorandum Opinion and Order, 16 FCC Rcd 17222, 17223, ¶2 (2001) (Finding that investing incumbent licensees with more flexibility in the use of their assigned spectrum would foster the introduction of new services, promote competition, and permit market forces to determine the best use for the spectrum.).

<sup>54</sup> In this *Notice*, the term vessel includes every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on the waters of the United States. See *NOAA Nautical Chart User's Manual*, by Mr. L. Daniel Maxim with the cooperation of the Marine Chart Division, Office of Coast Survey, National Ocean Service, National Oceanic and Atmospheric Administration, (NOAA) (1997) (*NOAA Nautical Manual*). <http://chartmaker.ncd.noaa.gov/staff/NCUM/Glossary.pdf>. See also 47 U.S.C. § 153(39)(A) (definition of "vessel").

<sup>55</sup> MTN Reply at 15; SIA Comments at 2; Intelsat Comments at 2.

non-coordinated basis, but with strict requirements for ESV tracking and resolution of claims of harmful interference. The second method would require frequency coordination for C-band ESVs operations under certain technical requirements designed to reduce potential harmful interference to terrestrial FS systems. Some of the technical and operating requirements are different under each approach. As explained below, a licensing procedure with established technical and operational requirements for ESV network operations would provide a stable regulatory environment for ESV operators, vessel operators, service providers, and FS and FSS licensees.<sup>56</sup> Establishing a licensing procedure would also allow us to implement, in part, the decisions of the WRC-03.

#### A. Basis For ESV Operations and U.S. Table of Frequency Allocations Issues

26. Currently, a limited number of ESVs are permitted to operate in the C-band and Ku-band through waivers of the U.S. Table of Frequency Allocations ("U.S. Allocations Table") in Section 2.106 of the Commission's Rules.<sup>57</sup> This process of issuing waivers for ESV operations leads to a failure of our Rules to reflect fully and clearly the various types of operations that may exist in a given band, is inefficient, and can result in uncertainty with respect to the continued renewal of the waiver. Further, WRC-03 addressed the issue of ESVs and made certain findings that should be considered for domestic implementation. Therefore, we propose to modify the U.S. Allocations Table to allow for ESV operations in the C-band and Ku-band as discussed below.

27. First, we address the regulatory status of ESV operations. In some respects, ESVs operate similarly to a mobile satellite service (MSS) because the vessels quite often are moving. In other respects, ESVs are more like FSS in that they use earth station antennas with operational characteristics that are similar or identical to FSS earth station antenna with the exception of added stabilization and pointing mechanisms. Also, unlike MSS, FSS has a primary allocation in both the C- and Ku-bands -- MSS has a secondary allocation in the Ku-band and no allocation in the C-band. In addition, some ESVs could be stationary for various periods of time, including periods greater than six months or a year (e.g., oil drilling platform or ships at harbor).

28. The treatment of ESVs at WRC-03 takes two tracks with respect to the international classification of ESVs. On one hand, we note that while footnote 5.457A is associated with the FSS primary allocation in the international Table of Frequency Allocations, the footnote does not identify whether ESV services should be treated as primary, secondary, or with other regulatory status; it merely states that ESV "use shall be in accordance with Resolution 902."<sup>58</sup> We note that with respect to the receive bands, Annex 1 of Resolution 902 states that ESV receivers "in motion" shall not claim protection.<sup>59</sup> On the other hand, the ITU's treatment of ESVs in other respects indicates that WRC-03 intended that ESV use be treated as primary use within the band, so long as that use was fully consistent with the provisions of Resolution 902. For example, noting b) of Resolution 902 states that the

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<sup>56</sup> Intelsat Comments at 2; SIA Comments at 3. ESV proponents encourage the Commission to adopt a licensing regime for ESV operations. MTN Comments at 13-14; Hughes Comments at 2; Inmarsat Comments at 1-2; SIA Comments at 3; Intelsat Comments at 2; Boeing Comments at 1.

<sup>57</sup> 47 C.F.R. § 2.106.

<sup>58</sup> ITU RR 5.457A (WRC-03).

<sup>59</sup> ITU-R Resolution 902 (WRC-03), Annex 1 and at *noting b*). ITU Article 9 is used for the international coordination of primary FSS earth stations.

procedures of Article 9 apply to ESVs "operating at specified fixed points."<sup>60</sup> Similarly, Annex 1 of Resolution 902 requires that ESVs be subject to prior agreement from a foreign administration only where FS or mobile services are allocated on a primary basis in the bands in which ESVs seek to operate.<sup>61</sup>

29. From a practical point of view, we note that domestically the C-band is used extensively for FS<sup>62</sup> (in addition to FSS) while there appears to be very little use of the Ku-band for terrestrial services.<sup>63</sup> Accordingly, it is significantly more difficult to establish a regime to permit sharing between FS systems and "in-motion" ESVs in the C-band as compared with the Ku-band. For this reason, we strongly favor rules that would encourage ESV use of the Ku-band over the C-band. We also recognize that the regulatory status that we establish for ESVs will affect not only incumbent operations in each band, but also the opportunity for expansion of those existing services.

30. Considering these factors, we propose domestic rules that would authorize ESVs to operate on a primary basis in the Ku-band, which would permit ESVs to be a recognized application within FSS networks during inter-system coordination and would make ESVs equal in priority to other applications in the band. We also propose domestic rules that would authorize ESVs to operate on a non-harmful interference basis ("NIB") in the C-band in order to protect the primary FS operations in the C-band. However, we request comment on whether ESV operations in the Ku-band warrant the same secondary status as MSS operations in the band or, alternatively, would be better governed through regulation under the secondary MSS allocation. We note that such secondary regulatory treatment would put ESVs on an equal footing with MSS in that band (e.g., OmniTRACS<sup>64</sup> and Boeing's Connexion<sup>65</sup>) but could place U.S. ESV operators at a lower priority status than might be the case for foreign-licensed ESV operators.

<sup>60</sup> ITU-R Resolution 902 (WRC-03), at *noting b*. ITU Article 9 is used for the international coordination of primary FSS earth stations.

<sup>61</sup> ITU-R Resolution 902 (WRC-03), Annex 1, Nos. 4 and 5.

<sup>62</sup> The C-band is used extensively in the United States for point-to-point microwave services. FS point-to-point applications in this band include interconnecting mobile radio base stations used for dispatching vehicles (including public safety vehicles); remote control of railroad switches and signals, pipeline valves, and electric utility circuit breakers; and carrying backhaul traffic on cellular and PCS systems.

<sup>63</sup> We note that a limited number of government stations, including terrestrial stations, operate in the 14.0 - 14.5 GHz band. The government operations are discussed in sections of this NPRM that address the specific frequency segment used by these operations.

<sup>64</sup> Qualcomm's OmniTRACS service processes more than six million transactions each day sent to and from a quarter million trucks. See *Qualcomm Services Keeps on Trucking*, July 31, 2001, at <http://www.business2.com/articles/web/print/0,1650,16490,FF.html>.

<sup>65</sup> In April 2001, the International Bureau and the Office of Engineering and Technology granted a waiver to Boeing, in similar fashion to the waiver granted to MTN, so that it could operate receive-only mobile earth stations aboard aircraft in the 12 GHz band. *Boeing Company Application for Blanket Authority to Operate Up to Eight Hundred Technically Identical Transmit and Receive Mobile Earth Stations Aboard Aircraft in the 14.0-14.5 GHz and 11.7-12.2 GHz Frequency Bands*, Order and Authorization, 16 FCC Rcd 5864 (2001). In December 2001, that waiver grant was expanded to include the operation of mobile earth stations aboard aircraft in 14.0-14.5 GHz band (uplink) and the 11.7-12.2 GHz (downlink) band. *Boeing Company Application for Blanket Authority to Operate Up to Eight Hundred Technically Identical Transmit and Receive Mobile Earth Stations Aboard Aircraft in the 14.0-14.5 GHz and 11.7-12.2 GHz Frequency Bands*, Order and Authorization, 16 FCC Rcd 22645 (2001).

We also seek comment on whether we should require ESVs in the Ku-band to operate on a non-harmful interference basis to the secondary Ku-band services, as would be typical for operations that are non-conforming to the allocations table. Regarding C-band ESVs, we seek comment on whether NIB status is appropriate given the density of FS operations in the band. We also seek comment on whether it might be feasible to permit ESV operations in C-band other than on a non-harmful interference basis such as when the ESV is not in motion, and if so under what conditions. Under any of these circumstances, we propose to adopt non-Federal Government ("NG") footnotes in the U.S. Table of Frequency Allocations to allow ESVs to communicate with FSS space stations in the C- and Ku-bands.

## **1. Ku-Band**

### **a. 11.7-12.2 GHz Band**

31. The 11.7-12.2 GHz band is allocated to the FSS for downlink operations on a primary basis and is extensively used for VSAT downlink operations. The 11.7-12.2 GHz band is also allocated to mobile, except aeronautical mobile, service on a secondary basis for non-Federal Government use and the 11.7-12.1 GHz sub-band is allocated to the fixed service on a secondary basis for Federal and non-Federal Government use.<sup>66</sup> The Local Television Transmission Service (LTTS) makes use of these fixed and mobile allocations. Specifically, frequencies in the band 11.7-12.2 GHz band are available for assignment to television pickup stations, television non-broadcast pickup stations, and television studio-to-transmitter links.<sup>67</sup> A search of our database indicates that there are 44 authorizations for LTTS use in the band, and all but 10 of these authorizations cover multiple bands, including several that are more commonly used for LTTS operations. Given the near ubiquitous deployment of VSAT operations in this band, it is doubtful that many LTTS operations make use of the fixed and mobile allocations at 11.7 GHz. Therefore, we seek comment on whether LTTS operations make significant use of the 11.7-12.2 GHz band, and if not, whether we should remove the secondary allocations for the fixed and mobile except aeronautical mobile services and related Part 101 rules for LTTS in this band due to its predominant use for satellite operations. We seek comment on this allocation removal because generally, it would be difficult to protect mobile ESV receivers from terrestrial mobile transmitters in this band. Because many of the LTTS licenses specify alternate operational frequencies not in the C-band or Ku-band, if we remove the allocation, we also seek comment on whether we should grandfather existing LTTS stations if the allocation is removed.

32. We note that Annex 1 to Resolution 902 at WRC-03 stated that: "ESVs in motion shall not claim protection from transmissions of terrestrial services operating in accordance with the Radio Regulations."<sup>68</sup> While we tentatively conclude the status of ESV operations should be on a primary basis consistent with the paired uplink portion at 14.0 GHz, we note it is very difficult to protect moving receivers from possible interference from even secondary transmitters. We therefore propose to adopt this Resolution 902 requirement domestically. We also seek comment on whether ESVs receiving in the 11.7-12.2 GHz band should be entitled to claim protection from terrestrial services when the ESV is not in motion. Further, given the unlikelihood of interference to ESVs from terrestrial U.S. sources, we question whether there is sufficient need to delineate between the status of ESVs that are "in motion" versus stationary. If we do have distinct status for in-motion versus stationary vessels, it will be

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<sup>66</sup> See 47 C.F.R. § 2.106, footnote 5.486.

<sup>67</sup> See 47 C.F.R. §§ 101.101, 101.147(a), 101.803(a) and (d). No channel plan is listed in Part 101 for LTTS.

<sup>68</sup> ITU-R Resolution 902 (WRC-03), Annex 1.

necessary to define the situations that would qualify as stationary, and we seek comment on what that definition should be.<sup>69</sup> We propose to establish a new non-Federal Government footnote for the 11.7-12.2 GHz band to indicate that ESVs may operate with FSS space stations, so that parties are aware that mobile receivers may be operating in the band. We believe our rules should clearly reflect the various types of operations that use a spectrum band. We request comment on this proposal.

**b. 14.0-14.5 GHz Band**

33. The 14.0-14.5 GHz band is the uplink portion of the primary status Ku-band FSS allocation. This band is extensively used by the FSS for VSAT uplink operations, and various other satellite and terrestrial operations exist in the band to a lesser extent under other allocations as discussed below. Further, the Commission recently implemented a WRC-03 decision by adopting a generic secondary allocation to the MSS (earth-to-space) in the band 14-14.5 GHz.<sup>70</sup> This generic allocation permits all MSS, including maritime mobile-satellite and aeronautical mobile-satellite services, on a secondary basis. Below we will consider how ESVs will co-exist with the various operations in this band.

**(i) 14.0-14.2 GHz Band**

34. The 14.0-14.2 GHz portion of the Ku-band is allocated on a primary basis in the United States to FSS for non-Federal Government operations and to radionavigation services for non-Federal Government and Federal Government operations. The band is also allocated on a secondary basis to MSS (Earth-to-space) for non-Federal Government use and to space research services for Federal Government and non-Federal Government use. The only authorized non-FSS facilities in this band are two government space research Tracking and Data Relay Satellite System (TDRSS) facilities (located in White Sands, NM, and Guam) and a very limited number of commercial radionavigation equipment that are limited to test purposes.<sup>71</sup> There are plans to add another government TDRSS space research station in this portion of the Ku-band in either Langley, Virginia, or Wallops Island, Virginia. We recognize the importance of these space research facilities and believe it is appropriate to protect these stations from receiving harmful interference. Because the operational range of ESVs is limited to oceans, large rivers and lakes and because NASA will have a very limited number of space research earth stations, which will be receiving from the Government data relay satellites, we believe that coordination between these two operations is possible and will not prove to be a burden on the ESVs. We note that this may not be the case for other Ku-band FSS applications. With that in mind, we propose that applications for Ku-band ESVs be required to be coordinated through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee's (IRAC) before awarding a license for this service,<sup>72</sup> and, if necessary, that the appropriate government agency deal directly with the

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<sup>69</sup> For example, how long does a vessel have to be moored or anchored to not be "in-motion"? Should a vessel that can be moving in a short amount of time be treated the same as a vessel for which significant preparation and time is needed to move?

<sup>70</sup> See Amendment Of Parts 2, 25, And 87 of the Commission's Rules to Implement Decisions from World Radiocommunication Conferences Concerning Frequency Bands Between 28 MHz And 36 GHz and to Otherwise Update the Rules in this Frequency Range, Report and Order, FCC 03-269 (Nov. 4, 2003).

<sup>71</sup> See 47 C.F.R. § 87.375(d)(2). These authorizations were granted more than a decade ago.

<sup>72</sup> NTIA is responsible for managing the government portion of the Table of Frequency Allocations. In bands shared between Federal and non-Federal Government services, the Commission and NTIA operate under a long-standing (continued....)

applicant to resolve any potential problems. We seek comment on this approach to protecting the space research service in the 14.0-14.2 GHz band. Additionally, we propose that a footnote be added to the U.S. Table of Allocations that states, in part, that that ESVs operating in this band ensure the protection of the space research operations. We seek comment on this proposal. We also note that in WT Docket 01-289, the Commission has proposed to remove the radionavigation allocation from the 14.0-14.2 GHz band because it is not significantly used and could potentially conflict with various satellite operations in the band.<sup>73</sup> Therefore, we do not anticipate any interference conflicts between ESVs and radionavigation operations.

35. With respect to secondary MSS operations in the 14.0-14.2 GHz portion of the Ku-band, we note that such operations exist, but due to our blanket authorization process, we are unaware of the precise number and locations of terminals using the band. Existing MSS operations on vehicles and aircraft essentially operate as ESVs do in that they transmit and receive from mobile platforms to FSS space stations by using tracking technologies to ensure that the mobile antenna remains aligned with the appropriate satellite. We note that aeronautical MSS operations exist in this band on a waiver basis and the Commission will soon consider a petition filed by Boeing to establish permanent rules for these operations.<sup>74</sup> Nevertheless, in this proceeding, we seek comment on whether these developments present any issues for consideration in connection with the authorization of ESVs in the Ku-band. Does this new aeronautical MSS allocation present a potential interference problem to ESV network operations in the same frequency band? We seek comment on the possibility of mutual interference between ESVs and MSS stations operating in the secondary MSS allocation, although we tentatively conclude that these operations should be able to share the 14-14.2 GHz band as long as they comply with the limitations proposed below. Regarding normal FSS operations, we believe following our 2-degree spacing rules will protect existing and future FSS operations from harmful interference. Accordingly, we propose to allow ESV operations to communicate with FSS space stations in the 14.0-14.2 GHz band on a primary basis. We request comments on this approach.

#### **(ii) 14.2-14.4 GHz Band**

36. The 14.2-14.4 GHz segment is an exclusive non-Federal Government use band that is allocated on a primary basis to FSS for uplink operations and on a secondary basis to the MSS and the mobile, except aeronautical mobile, service. For the same reasons as apply to the 14.0-14.2 GHz band, we propose to allow ESV operations to communicate with FSS space stations in the 14.2-14.4 GHz band on a primary basis.

37. Similar to the 11.7-12.2 GHz band, the secondary mobile allocation at 14.2-14.4 GHz is available for LTTS for television pickup and television non-broadcast pickup stations under Part 101 of

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coordination agreement. See NTIA Manual, Basic Coordination Arrangement Between IRAC and the FCC, [http://www.ntia.doc.gov/osmhome/redbook/NTIAmanual\\_May2003.pdf](http://www.ntia.doc.gov/osmhome/redbook/NTIAmanual_May2003.pdf) at Chapter 8.3.1.

<sup>73</sup> See *Review of Part 87 of the Commission's Rules Concerning the Aviation Radio Service*, WT Docket No. 01-289, Report and Order and Further Notice of Proposed Rule Making, WL22349681, ¶85, FCC 03-238, (rel. Oct. 16, 2003).

<sup>74</sup> Request Amendment of the Commission's Rules to Adopt Licensing and Service Rules for Aeronautical Mobile Satellite Service Operations in the 14-14.5 GHz band on a Secondary Basis, filed by The Boeing Company, ET Docket No. 02-305 (received by the Commission July 21, 2003).

our rules.<sup>75</sup> A recent review of our licensing database for this band finds that there are 25 LTTS licenses.<sup>76</sup> Some are licensed for nationwide operations and others are limited to specific states. Some of those states are on the U.S. coast and others are in the interior of the United States. Our records do not show, however, how many of these licensees are actually using this spectrum since LTTS licenses specify multiple frequency bands on the same license. Because many of these LTTS licenses include multiple frequency bands and provide for operations anywhere within the continental United States, we are unable to confirm whether any LTTS operations exist in the 14.2 GHz band.<sup>77</sup> Given the current level of use of the secondary mobile, except aeronautical mobile, allocation in the 14.2-14.4 GHz band and the availability of other bands for LTTS operation, as contrasted with the increasing variety of satellite operations that plan to use this spectrum, we seek comment on whether we should remove the terrestrial secondary mobile allocation from the 14.2-14.4 GHz band. We seek comment also on whether any existing terrestrial secondary mobile operations should be grandfathered or should be required to cease operations in this band.<sup>78</sup> If secondary LTTS operations are permitted to continue using the 14.2 GHz band, whether on a continuing allocation basis or as grandfathered operation, what should their status be relative to ESV operations?

### (iii) 14.4-14.5 GHz Band

38. In addition to the non-Federal Government primary FSS and secondary MSS allocations in the 14.4-14.5 GHz segment, the Federal Government has secondary FS and mobile allocations in the band. Our records indicate that there are several fixed point-to-point operations and a limited number of fixed stations used by the Federal Government for terrestrial telecommand. There are also several Federal Government aeronautical mobile stations, land-based aeronautical mobile stations, and land mobile stations in the band. Furthermore, there are several Federal Government surface telemetering mobile stations in the band that are used to send telemetry information to other stations on the ground. The 14.4-14.5 GHz band appears to be used predominately by fixed, mobile, and transportable telemetry microwave systems. The band is also used to transmit air traffic control video links, closed circuit television, and range test data (including airborne downlink data transmissions). Moreover, the band 14.47-14.5 GHz is available to the radio astronomy service at thirteen observatories in the United States

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<sup>75</sup> See Part 101.147, note 24. Additionally, LTTS operations in the 14.2-14.4 GHz band are limited to a maximum power of +45 dBW except that operations are not permitted within 1.5 degrees of the geostationary arc.

<sup>76</sup> Specifically, the staff conducted an "Advanced License Search" using the Universal Licensing System (ULS) on September 23, 2003. The ULS search was limited to active status and regular authorization type.

<sup>77</sup> A recent order issued by the International Bureau and the Office of Engineering and Technology stated that Boeing had indicated that it had examined the Commission's licensing database and found twenty LTTS licensees for this band, and in all cases, the licenses also included authorization to operate in other bands pursuant to Section 101.803 of the Commission's rules. *The Boeing Company Application for Blanket Authority to Operate Up to Eight Hundred Technically Identical Transmit and Receive Mobile Earth Stations Aboard Aircraft in the 14.0-14.5 GHz and 11.7-12.2 GHz Frequency Bands*, Order and Authorization, 16 FCC Rcd 22645, ¶ 7 (2001) (citing page 40 of the technical supplement to the application of Boeing filed in the proceeding). In that proceeding, Boeing stated that it attempted to contact the LTTS licensees, but most were no longer in business, and those that were still operating indicated that they did not utilize the 14 GHz band. *Id.*

<sup>78</sup> If the allocation is deleted, the service rules for this use would also be deleted. Specifically, 14.2-14.4 GHz would be deleted from Section 101.147(a) and note 24 would be deleted in its entirety.

and its possessions.<sup>79</sup> We seek comment on the extent to which the 14.4-14.5 GHz band is used to provide these services. Are there any services for which it is not necessary for the Commission to seek interference protection if we were to permit ESV operations in this frequency band? Could these services be protected adequately from possible ESV operations in the 14.4-14.5 GHz band?

39. We propose that a footnote be added to the U.S. Table of Allocations that states, in part, that ESVs operating in the 14.47-14.5 GHz band shall avoid harmful interference to stations of the radio astronomy service in the band, as specified in existing footnote US 203. We seek comment on adding such a new footnote to the U.S. Table of Allocations. Additionally, in a similar approach to that dealing with space research stations in the 14.0-14.2 GHz band, we propose that applications for Ku-band ESVs be coordinated with IRAC and, if potential problems exist with these radio astronomy sites that the appropriate Government agency deal directly with the applicant to resolve any potential problems. As we stated in the discussion addressing sharing between ESVs and space research in the 14.0-14.5 GHz band, because of the constrained service area of the ESVs and the limited number of RAS locations we do not believe protecting the RAS sites will place a burden on the ESV operators. As previously noted, this may not be the case for other Ku-Band FSS applications. We seek comment on this approach to protecting the radio astronomy service in the 14.47-14.5 GHz band.

40. Notwithstanding the other services in this band, to remain consistent with the outcome of WRC-03 and to encourage use of the Ku-band, we propose to permit ESV operations in the 14.4-14.5 GHz band. However, we note that in the United States coordination between widespread mobile systems and the various mobile satellite transmitting terminals, including ESVs, may be difficult, especially if aeronautical mobile operations in this band use airborne receivers in this band. Accordingly, we seek comment on our proposal to extend ESV services to include the 14.4-14.5 GHz portion of the band. Is this additional spectrum needed for ESV operations at this time, especially in light of our proposal to allow ESVs in the 14.0-14.4 GHz band? If the 14.4-14.5 GHz band is needed for ESV operations, are any additional limitations on ESVs needed due to the various Federal Government operations?

### **c. Proposed Footnotes**

41. Based on our proposals to permit ESVs in the 11.7-12.2 GHz and 14.0-14.5 GHz bands to communicate with space stations of the FSS, we propose to add the following non-Federal Government footnote NGyyy to the U.S. Allocations Table for these bands:

NGyyy In the bands 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space), earth stations on board vessels (ESVs) may communicate with space stations of the fixed-satellite service on a primary basis. ESV operators shall take all practical steps to comply with ITU Resolution 902 (WRC-03).

We seek comment on this proposal.

42. In order to protect Government operations, we propose to add the following Federal Government footnote USxxx to the U.S. Allocations Table for the 14.0-14.5 GHz band:

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<sup>79</sup> The sites are the National Astronomy and Ionosphere Center, Arecibo, Puerto Rico; the National Radio Astronomy Observatory, Green Bank, W. Va.; the Very Large Array, Socorro, New Mexico; and the ten Very Long Baseline Array (VLBA) Sites: St. Croix, VI; Hancock, NH; N. Liberty, IA; Ft. Davis, TX; Los Alamos, NM; Pie Town, NM; Kitt Peak, NM; Owens Valley, CA; Brewster, WA; Mauna Kea, HI.



USxxx Earth stations on vessels operating in the band 14-14.5 GHz shall not cause harmful interference to Federal Government stations of the space research service in the band 14-14.2 GHz nor to stations of the radio astronomy service in the band 14.47-14.5 GHz.

We seek comment on this proposal.

## 2. C-Band

43. The C-band is composed of the 3700-4200 MHz band for FSS downlink operations paired with the band 5925-6425 MHz for uplink operations. Both bands are allocated to the FSS and the FS on a co-primary basis for non-Federal Government use. The band is extensively used by both services and sharing is made possible through our coordination procedures outlined in Sections 25.203 and 101.103 of our rules.<sup>80</sup> ESV access to the C-band is more difficult than at Ku-band due to the prevalence of FS operations, but ESV operation in the C-band is desirable due to the global coverage of C-band satellites. Therefore, we propose to allow ESV operations in the C-band, subject to certain limitations to ensure the protection of incumbent users of the band, as discussed below.

### a. 3700-4200 MHz Band

44. We note that it is difficult for mobile transmitting terminals to avoid fixed receivers in a shared band without some form of coordination or other sharing technique. However, services with fixed directional antennas can make greater use of the spectrum by focusing their signals to desired locations. This is one reason the C-band is extensively used by both FSS and FS resulting in increased spectral efficiency. Mobile transmitters, by their very mobility, are more problematic, and we note that for this reason there is no allocation for mobile service in this band. We note, however, that ESVs will be limited to major waterways and the open seas and we believe that ESVs can also be included in this sharing environment with appropriate limitations. Therefore, we propose to allow ESVs to communicate in the 3700-4200 MHz band with FSS space stations, provided they are not permitted to claim protection from or otherwise impose constraints on the operation or development of other radio services operating in the band. We tentatively conclude that this NIB status is appropriate because it would be difficult to protect mobile ESV receivers from fixed service transmitters. This tentative conclusion is consistent with Annex 1 to Resolution 902 at WRC-03 concerning C-band operations, which states: "ESVs in motion shall not claim protection from transmissions of terrestrial services operating in accordance with the Radio Regulations."<sup>81</sup> While WRC-03 did not adopt specific provisions for when ESVs operating in the 3700-4200 MHz band can claim protection from fixed services when the ESV is not in-motion, we tentatively conclude that the NIB status should apply to all ESV operations at C-band, due to the existence of extensive FS. Accordingly, we propose to allow ESVs to receive communications from FSS satellites operating in the 3700-4200 MHz band (downlink) band subject to any limitations for that band established in this proceeding. We propose to adopt a footnote in our U.S. Allocations Table to acknowledge ESV operations in this band, even though WRC-03 did not adopt a similar footnote. We seek comment on this proposal. We note that WRC-03 indicated that for international purposes ESVs at fixed points should be treated like as normal FSS system. Noting b) of Resolution 902 states that "the regulatory procedures of Article 9 apply for ESVs operation at specific fixed points." In the past we have generally not regarded a station as fixed unless it remains in the same location for six months or longer. Commenters should address the specific coordination status and applicable coordination procedures for

<sup>80</sup> See 47 C.F.R. §§ 25.203 and 101.103.

<sup>81</sup> ITU-R Resolution 902 (WRC-03), Annex 1.

ESVs operating at a fixed point. Commenters may also address whether ESVs not "in-motion" merit some level of protected status if coordinated with fixed operations as is discussed below. In this connection, we also seek comment on whether there are any considerations with respect to the 3700-4200 MHz band that are different from the Ku-band that would justify defining the term "in motion" differently for the two frequency bands.

**b. 5925-6425 MHz Band**

45. Regarding C-band ESV uplink operations, we propose to permit ESVs to communicate with space stations of the FSS in the 5925-6425 MHz band. Such operations have proven successful on a limited basis through our waiver process, and we believe that increased ESV use of this band is possible with the rules to be developed in this proceeding. However, due to the use of the band by fixed service, we propose that ESV operations in this band shall not cause harmful interference to, claim protection from, or otherwise impose constraints on the operation or development of other radio services operating in the bands. We seek comment on this proposal. We also seek comment on whether it might be feasible to permit ESV operations in the 5925-6425 MHz band other than on a non-harmful interference basis, particularly if on a coordinated basis or if the ESV is not "in motion." In the operational section below, we will discuss whether there are portions of the band or licensing methods for which it might be possible to permit ESV operations without the limitations of NIB status.

**c. Proposed Footnotes**

46. Based on our proposals to permit ESVs in the 3700-4200 MHz and 5925-6425 MHz bands to communicate with space stations of the FSS, we propose to add the following footnote to the U.S. Allocations Table:

NGxxx In the bands 3 700-4200 MHz ( space-to-Earth) and 5 925-6425 MHz ( Earth-to-space), earth stations on board vessels (ESVs) may communicate with space stations of the fixed-satellite service on the condition that such use not cause harmful interference to, claim protection from, or otherwise impose constraints on the operation or development of fixed stations that operate in these bands. ESV operators shall take all practicable steps to comply with ITU Resolution 902 (WRC-03).

We seek comment on how this footnote should be modified if ESV status will vary dependent on whether a particular ESV operation meets different regulatory requirements, such as coordination, as discussed below.

**B. Operational Considerations for ESV Networks in the Ku-band**

47. For all ESV operations in the Ku-band, we seek comment on whether to limit ESV antenna elevation to some minimum value. If so, what should be the value? Furthermore, we propose that Ku-band ESV operators should make available, on a real-time basis, vessel tracking information in a secure fashion. We seek comment on whether providing this information will assist in resolving interference and aids in enforcement. What kinds of security concerns would this requirement pose, particularly to the federal government customers of ESV operators?<sup>82</sup> Must this information be made available in real-time considering the limited number of terrestrial Ku-band operations and the alternative frequencies that such terrestrial operators may have available to them, or should it be made available upon request? What

<sup>82</sup> See *infra* Sections A and B, for a more detailed discussion of vessel tracking requirements.

is the cost to ESV operators for making such information available on a real-time basis?

48. ESV networks operate under the direct control of a hub earth station. The individual ESV stations can operate anywhere in the satellite footprint. We seek comment on whether ESVs should be permitted to operate under blanket licensing rules<sup>83</sup> that are similar to those under which VSATs operate.<sup>84</sup> Generally, blanket licensing for VSATs requires applicants to request a single license for the overall earth station network including the hub earth station and remote earth stations without site-specific information on each remote earth station.<sup>85</sup> We consider this approach for ESVs because the number and mobility of ESV locations would make it impractical to license ESVs on a site-by-site basis, and because the International Bureau has previously determined that the Commission does not have authority to license individual ESVs aboard foreign-flagged ships, but does have authority over the hub earth station in the United States that controls access to the network by remote stations.<sup>86</sup> Under a blanket licensing approach, applicants would be required to file a narrative describing the overall system operation as well as specific information on the antennas, power density, and emission characteristics for each class of earth station comprising the network. We would require a point of contact to maintain information about the location of vessels and the frequencies that they use. After the applicant submits this and other relevant information, the Commission can then issue a blanket authorization for the system, which would encompass each hub station and each class of remote fixed earth station or temporary-fixed earth station in the network.<sup>87</sup>

49. We believe that blanket licensing may be possible for ESVs that operate in the Ku-band that meet the technical requirements currently in place for VSAT networks.<sup>88</sup> Both Ku-band ESV and VSAT networks consist of integrated networks of technically equivalent earth stations associated with large hub stations that control their operations. We believe that if Ku-band ESV operators agree to operate under

<sup>83</sup> *Routine Licensing of Large Networks of Small Antenna Earth Stations Operating in the 12/14 GHz Frequency Bands*, Declaratory Order, 1986 WL291567 at ¶¶ 4-6 (*VSAT Order*). A Form 312 is required for each large (i.e. diameter of 5 meters or more) hub station in addition to one Form 312 for each representative type of small (i.e. diameter of less than 5 meters) earth terminal to be employed in the network. *Id.*

<sup>84</sup> 47 C.F.R. § 25.134.

<sup>85</sup> The satellites used in an ESV network must be authorized to serve the United States. If an ESV network operator proposes to communicate with a non-U.S.-licensed satellite the ESV operator would be required to receive a case-by-case authorization to access the non-U.S. satellite. *Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Satellites Providing Domestic and International Service in the United States*, Report and Order, 12 FCC Rcd 24094 (1997) (*DISCO II*). ESV providers operating a network out of the United States would have to get Commission authorization for four things: access to U.S. satellites; access to non-U.S. satellites; service to U.S. vessels; and service to non-U.S. vessels.

<sup>86</sup> *MTN Order*, 15 FCC Rcd at 23214-15, ¶9.

<sup>87</sup> *VSAT Order*, 1986 WL291567 at ¶20.

<sup>88</sup> Section 25.209 of our rules sets forth antenna performance standards, which govern antenna transmission patterns. 47 C.F.R. § 25.209. Any antenna smaller than 1.2 meters in the Ku-band and 4.5 meters in the C-band is considered to be a non-conforming antenna. Specifically, the antenna transmission patterns do not conform to the antenna pattern defined in section 25.209(a) and (b). Section 25.209(f) requires applicants to present evidence that they will not cause unacceptable interference under conditions of uniform two degree orbital spacing. 47 C.F.R. §§ 25.209(a) and (f). Sections 25.134 (a) (1) and (b) specify the power levels required to qualify for routine processing. 47 C.F.R. §§ 25.209, 134(a) (1), and (b).

the same technical requirements as those imposed on VSAT blanket licensees, the requirements that are designed to minimize interference concerns to adjacent satellites would be sufficient to support Ku-band ESV licensees under the same blanket licensing process. Therefore, we propose to amend Sections 25.115 and 25.134 of our rules to permit blanket licensing of ESV operations in the 14.0-14.5 GHz portion of the Ku-band on the same basis as Ku-band VSAT systems. We seek comment on this approach.

50. Specifically, we propose to add a new subsection 25.115(c)(3) to include Ku-band ESV networks within the current blanket licensing process. Subsection 25.115(c)(3) would permit parties to apply for blanket licensing of Ku-band small antenna network systems.<sup>89</sup> Under our proposed rule, a Ku-band ESV applicant would be required to provide information for each large hub station in its system and for each representative type of small antenna that it requests to operate within its ESV network, as VSAT applicants are currently required to do under 25.115(c)(1).

51. We also propose to amend Section 25.134(a) to include specifically provisions concerning ESV operations in the 14.0-14.5 GHz portion of the Ku-band. Section 25.134 of our rules establishes a process for certain VSAT systems that have less potential to cause adjacent satellite interference: applicants that apply to operate below a stated EIRP density threshold benefit from greatly simplified application procedures, while those that propose to operate above the threshold are required to provide significantly more detailed information about their proposed operations.<sup>90</sup> We analyze the more detailed information to ensure that non-routine earth station operations will not cause unacceptable interference to adjacent satellite operators. Under our proposed amendment, and consistent with the current rules for traditional VSAT networks, we would require a new Ku-band ESV applicant that seeks to exceed the EIRP density thresholds to include an engineering analysis using the Sharp, Adjacent Satellite Interference Analysis (ASIA) program, demonstrating the applicant's ability to operate without causing unacceptable interference to adjacent satellites. We would also require the applicant to provide proof by affidavit that this operation has been coordinated successfully with adjacent satellite licensees that are two degrees removed in the GSO orbit from the satellite used by the ESV operator.<sup>91</sup> Under our proposal, we would grant applications for ESV networks that comply with these rules. We seek comment on these proposed rule changes.

52. We also seek comment on whether we should provide for licensing of individual earth stations, using the same technical criteria that are applied to the antennas in a blanket-licensed ESV network. Although we believe that demand for such uses will be limited, we seek comment on whether there are any specific rule provisions that might be required to address such cases.

53. Parties should comment on what method ESV operators should use to prevent adjacent satellite interference caused by ESVs' in-motion. For example, it is possible for an ESV-equipped vessel to move to a fringe area of satellite coverage and to operate at a higher power level using power control while the vessel is in the prime coverage area of another satellite, potentially causing interference to a

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<sup>89</sup> See Appendix A for specific rule changes that we propose.

<sup>90</sup> Compare 47 C.F.R. § 25.134(a)(1) (permitting routine processing of applications for operation below a stated maximum outbound downlink EIRP density) with 47 C.F.R. § 25.134(b) (requiring additional information of applicants proposing to exceed a stated maximum outbound downlink EIRP density, including an affidavit that "all potentially affected parties do not object" to the higher power the applicant proposes to use) (emphasis added).

<sup>91</sup> See 47 C.F.R. § 25.134(b).

neighboring satellite. We seek comment on whether we should require transmitter power control for Ku-band ESVs. If so, we seek comment on whether to require ESV network applicants to address in their applications this aspect of potential interference to adjacent systems.<sup>92</sup> We also seek comment on whether we should authorize Ku-band ESV operators to operate with any U.S.-licensed satellite (*i.e.* ALSAT authority<sup>93</sup>) and non-U.S. satellites on the Permitted List using the parameters consistent with earth stations. Or, for reasons relating to potential interference to two-degree spaced satellites, should ESV operators be granted authority to access individual satellites only?

54. Additionally, we seek comment on whether we should limit ESV operations to vessels that are 300 gross tons or larger. Vessels of this size are restricted to traveling in bodies of water of a certain depth, which could help keep ESVs away from existing in-land Ku-band operations. We seek comment on whether this restriction is necessary or appropriate given the current use in the 14.0-14.5 GHz band. We also propose, consistent with WRC-03 resolutions, that ESV systems be equipped with automatic mechanisms to terminate transmissions whenever the station operates outside its authorized geographic area or operational limits. This will ensure that ESVs operating on a non-harmful interference basis near the U.S. coastline are capable of resolving immediately any harmful interference caused to U.S. licensees that are operating in conformance with the U.S. Table of Frequency Allocations.

55. The WRC-03 adopted off-axis EIRP limits on ESV systems for the protection of adjacent FSS systems.<sup>94</sup> However, the limits adopted at the WRC-03 do not meet our rules for the routine processing of Ku-band VSAT systems operating with 1.2 meter antennas.<sup>95</sup> The protection of adjacent FSS systems, which over the United States may be spaced as closely as two degrees, is extremely important. We therefore propose that ESVs in the Ku-band requesting routine processing meet the requirements of Section 25.134(a)(1) and have at a minimum an antenna diameter of 1.2 meters. Ku-band ESVs meeting these requirements will therefore be compatible with our two-degree spacing rules. Additionally, we propose that the pointing accuracy of the ESV antenna should be no worse than 0.2 degrees, the value adopted at WRC-03. The use of smaller antennas or non-consistent power levels will require the filing of an initial lead application<sup>96</sup> that includes the information required in Section 25.134(b). This Section requires VSAT applicants to file all technical analyses required to demonstrate that unacceptable interference will not be caused to any and all affected adjacent satellite operators by

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<sup>92</sup> In the 2000 Biennial Regulatory Review - Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage By, Satellite Network Earth Stations and Space Stations, IB Docket 00-248, Notice of Proposed Rulemaking, 15 FCC Rcd 25128 (2000) (*Part 25 Streamlining Notice of Proposed Rulemaking*) the Commission sought comment on streamlining two types of non-routine earth station applications: (1) those seeking authority to operate an earth station with an antenna diameter too small to meet the routine processing standards of Part 25; and (2) those seeking authority to operate an earth station at a power level greater than those specified in Part 25. *Part 25 Streamlining NPRM*, 15 FCC Rcd at 25140, ¶31. In the *Part 25 Streamlining Further Notice*, the Commission sought further comment on other aspects of non-routine transmitting earth stations. 17 FCC Rcd at 18633, ¶132. Any rules that are adopted pursuant to the *Part 25 Streamlining NPRM* and *Part 25 Streamlining Further Notice* could also apply to ESV operations.

<sup>93</sup> *Satellite Licensing*, IB Docket No. 95-41, Report and Order, 1996 WL 103985, ¶28 (1996). Domestic satellites in the "domestic" portion of the orbital arc are referred to for licensing purposes as "ALSAT." *Id.*

<sup>94</sup> See ITU-R Resolution 902, Annex 2.

<sup>95</sup> See 47 C.F.R. § 25.134(a)(1).

<sup>96</sup> See 47 C.F.R. § 25.115(c)(4) (proposed).

the operation of the non-conforming earth station. The hub earth station licensee shall be responsible for all ESV compliance in its network and should have the capability to inhibit operations and/or terminate service to ESVs operating within its network, including any ESVs operating on ships that are foreign-flagged. We seek comment on these proposed rules for Ku-band ESV operations.

56. We note that in Resolution 902, the WRC-03 stated that licensing administrations may authorize the deployment of smaller antenna sizes down to 0.6 m at 14 GHz provided that the interference to terrestrial services is no greater than that which would be caused with an antenna size of 1.2 meters, taking into account Recommendation ITU-R SF.1650. We note that antenna sizes smaller than 1.2 meters decrease the cost of ship earth stations and so may be desirable provided compatibility with FSS and protection towards other users can be maintained. Accordingly, we seek comment on whether to permit the licensing of ESV earth stations in the 14 GHz band with diameters between 0.6 m and 1.2 meters, and under what conditions.

57. ITU Recommendation 37 encourages administrations to seek coordination agreements with affected administrations in the Ku-band.<sup>97</sup> Although coordination of FS in the 14.0-14.2 GHz portion of the Ku-band is not an issue in the U.S. context,<sup>98</sup> we recognize that other countries may have terrestrial operations in the Ku-band, and we seek comment on what, if any license conditions should apply to coordination in the Ku-band with respect to foreign administrations.

58. Other licensed networks of earth stations have fifteen-year license terms.<sup>99</sup> In the context of Ku-band ESV operations, we seek comment on whether there is any reason to diverge from the fifteen-year license terms. Nevertheless, we tentatively conclude that fifteen-year license terms for Ku-band ESV networks is reasonable. We seek comment on this tentative conclusion.

59. We believe that these proposals for licensing Ku-band ESV operations are consistent with the decisions of WRC-03. Additionally, our proposals would alleviate concerns that the current system of authorizing ESV operations with STAs results in longer overall processing times, additional administrative burdens, and increased uncertainty in the marketplace.<sup>100</sup> Furthermore, licensing Ku-band ESV operations would promote more intensive and efficient use of this band by encouraging new services to vessels at sea without restricting current usage and the expansion of current services.<sup>101</sup> We also note that commenters support a licensing procedure that is sufficient "to spur investment in [the] under-utilized [ESV] resource."<sup>102</sup> Because there are no primary terrestrial FS operators in the 14.0-14.2 GHz portion of the Ku-band in the United States, ESV coordination with FS may not be necessary. The record suggests that Ku-band ESV operations would likely proceed without undue complexity and ESVs would not need to be limited to specific periods of time at a given location or to certain pre-defined geographic areas. We seek comment on the above proposals and any other proposals or comments that may be raised in the record.

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<sup>97</sup> ITU-R Recommendation 37 (WRC-03).

<sup>98</sup> MTN Comments at 23; Inmarsat Comments at 6; Boeing Comments at 2.

<sup>99</sup> See 47 C.F.R. § 25.121.

<sup>100</sup> Cf. *CSAT Order*, 16 FCC Rcd at 11512, ¶1.

<sup>101</sup> Hughes Comments at 1; SIA Comments at 2; MTN Reply at 4-5.

<sup>102</sup> SIA Comments at 2; MTN Reply at 5; see also Harris MCS Comments at 4.

### C. Operational Considerations for ESV Networks in the C-band

60. Unlike the Ku-band in the United States, the C-band is shared by FSS and FS operators on a co-primary basis, and coordination among existing licensees, all of whose facilities are at fixed locations, is required in order to avoid harmful interference. Licensing mobile ESVs in the C-band will make the coordination process more complex. In particular, we note that there are FS operations in this band that ESV operations would be required to protect. Accordingly, we are proposing rules with a goal of encouraging ESV operators to operate in the portions of the Ku-band where there are no primary terrestrial FS licensees and where harmful interference to terrestrial systems is less likely to occur. Nevertheless, the international Radio Regulations permit portions of the C-band to be used for ESV operations, and in order to implement the decisions of WRC-03, we seek comment on a licensing mechanism for ESV operations in the C-band. We note that the rules that we are proposing for the C-band go further to restrict ESV operations than the operational rules that were adopted for the band at WRC-03. For example, we propose that C-band operations be on a non-harmful interference basis and propose in some instances to require an ESV operator to cease operations immediately pending resolution of alleged interference. We also seek comment below on whether an ESV operator that goes through a coordination process to avoid likely interference to FS operations should receive some kind of incentive to encourage coordination.

61. We recognize that ESV service was initially authorized on a limited basis in the C-band and that the service has grown significantly because of certain technical and economic advantages of the band.<sup>103</sup> Though ESV operations using the Ku-band would alleviate domestic concerns about the impact of the mobile ESV operations in C-band, ESV proponents state that the C-band is the only portion of the commercially available spectrum that currently offers sufficient bandwidth on a global basis for the type of services that ESV operators intend to provide.<sup>104</sup> For example, it could be advantageous for certain vessels to operate ESVs in the C-band from certain ports, such as when a vessel is required to travel to areas of the high seas where operating an ESV in the Ku-band is not possible or is inappropriate to meet the vessels' communications needs. Some international C-band satellites have beams that cover the ocean routes, whereas Ku-band satellites do not provide such coverage. It may not always be possible for vessels engaging in trans-Atlantic or trans-Pacific voyages to maintain Ku-band ESV communications over their entire voyage. Some commenters also argue that access to the C-band is necessary in light of the high volume of voice, data, and video information that flows through ESV networks on a daily basis.<sup>105</sup> We seek comment on whether there is sufficient Ku-band transponder capacity on currently launched and operational satellites to support ESV requirements in the Ku-band. Do the footprints of the Ku-band satellites extend far enough from the U.S. coastline to provide service to ships that traverse along the coastline (e.g. from San Diego to Anchorage)?<sup>106</sup>

62. As stated above, our goal is to develop approaches for licensing ESVs that would maximize the efficient use of both Ku-band and C-band spectrum while respecting the expectations of incumbent

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<sup>103</sup> MTN Comments at 9-11; Hughes Comments at 2; Intelsat Comments at 2; Inmarsat Comments at 2; SIA Comments at 2.

<sup>104</sup> MTN Comments at 10-11.

<sup>105</sup> MTN Comments at 10-11; Intelsat Comments at 2.

<sup>106</sup> We pose similar questions in paragraphs 80-81 and 95-98 regarding the benefits and drawbacks of permitting ESV operations in the C-band and Ku-band from the perspective of FS operators.

operators to operate free from harmful interference and to have the growth potential in the bands. To that end, we request that commenters specifically address the relative advantages and disadvantages of using ESVs in C-band versus Ku-band spectrum, with specific reference to any additional disadvantages limiting ESV operations to the Ku-band would impose on potential ESV licensees. We seek comment on the need for ESV operators to use the C-band. Commenters should identify the type of information that is transmitted by ESVs in the C-band that could not be accommodated in the Ku-band. What portion of that information is transmitted by the vessel operators, and what portion is transmitted by the passengers? Commenters should identify the specific U.S. ports where it is necessary for them to use the C-band and state why they cannot use the Ku-Band at those ports. In particular we seek comment on the availability of sufficient Ku-band capacity near the U.S. coastline. Generally, how far from the coastline would Ku-Band service be available? Do C-band satellites fully cover the oceanic regions or is C-band capacity over the Atlantic and Pacific limited to specific shipping routes? Commenters should indicate how many ESVs are currently operating in the C-band and identify the ESV network operators that use the C-band. Can any of the C-band transmissions be switched to the Ku-band? Is cost the major reason for maintaining operations in the C-band? We would like commenters to provide specific information about the costs of operating in the C-band versus the Ku-band. For example, how much does it cost to lease a Ku-band transponder as opposed to a C-band transponder? We would also like to know what efforts ESV operators, and others, have made to move ESV operations to the Ku-band. Is it possible in the near future that most, if not all, ESV operations in the United States can be conducted in the Ku-band? If so, would it be possible or appropriate to establish a plan to phase out C-band ESV operations and have ESVs transition to the Ku-band?

#### **1. Operation on a Non-Coordinated Basis (Non-Coordination Approach)**

63. We recognize that the busiest U.S. ports are located in populated areas in which numerous terrestrial FS operators already are located. In these areas, it might not be possible to coordinate successfully ESV operations in the C-band in such a way as to protect the long-term interests of terrestrial operations, and to license C-band ESV operations under our Coordination Approach, described below. We note that in most circumstances, at such ports, it is possible and it may be more appropriate for ESV operators to operate in the Ku-band. Nevertheless, in order to provide a mechanism for C-band ESV operations for such vessels while at the same time limiting the potential for harmful interference to terrestrial FS operators and protecting the long-term interests of terrestrial operations, we seek comment on a short-term licensing approach for C-band ESVs. This approach would be subject to conditions similar to those contained in the STA granted to MTN in September 2000 in the *MTN Order*, but with appropriate modifications.<sup>107</sup> Specifically, we seek comment on permitting, with certain conditions, licensing of hub earth stations in the United States to serve ESV networks in the C-band for all ESVs that are within 300 kilometers of the U.S. coastline, while docked at specific ports or harbors and while traveling to and from those ports or harbors.

64. Under our proposed Non-Coordination Approach, ESV operations would be licensed on a non-harmful interference basis for vessels 300 gross tons or larger while within 300 kilometers of the U.S. coastline, as recommended in ITU-R Recommendations.<sup>108</sup> The Non-Coordination Approach would also require real-time tracking of vessel locations and real-time FS operator access to the tracking data on a secure basis. The ESV operator would not receive any protection from future FS operations under this

<sup>107</sup> *MTN Order*, 15 FCC Rcd at 23217, ¶16.

<sup>108</sup> ITU-R Recommendation SF. 1585.



approach and the license term would be for two years. We seek comment on this approach and whether this alternative should be available to all potential C-band ESV licensees. For example, should an applicant be required, first, to demonstrate that it could not successfully coordinate spectrum in the C-band to meet its service objectives at a certain location? Should the applicant also be required to demonstrate that Ku-band operations in that location would not be feasible?

65. We propose to place additional conditions on ESV network operators because the operations of the ESVs authorized under this alternative approach would not be coordinated. Consistent with Resolution 902, we would require that the ESV network operator make available 24 hours a day and seven days a week a point of contact for its network and the name of the ESV operator(s) associated with its network.<sup>109</sup> We would also require an accurate list of the vessels on which the ESVs are located; the frequency, bandwidth, and satellites that the ESVs are using; and an itinerary for each vessel from which the ESVs are operating in the network. We seek comment on whether ESV operators should be required to provide this information to the Commission directly or whether it would be more efficient for that information to be provided to a third-party, single point of contact representing commercial interests and government agencies. Working through a single, third-party entity may provide a more controlled environment for exchanging the necessary information.

66. We also propose to require the vessels operating ESVs to be equipped with a suitable method for real-time tracking and identification and provide FS licensees real-time access to a secure database containing this information. We seek comment on this proposal. Furthermore, we propose that the operator of the U.S. hub earth station that controls the ESVs would have the responsibility under its license to ensure that all Commission regulations and policies were being followed. The hub earth station operator would be required to be capable of terminating service to and from any of its ESVs in the network that did not comply with Commission rules. We seek comment on these additional conditions.

67. We also would require FS operators to appoint a person or an entity to serve as a point of contact for complaints from all FS operators. To the extent FS operators have unidentified claims of harmful interference, we presume that FS operators would contact the designated FS point person and provide a full description of the interference event. The FS point person would then present the interference claim to the ESV point of contact and have secure access to the vessel tracking system. The parties would then try to resolve the claim of harmful interference. We seek comment on this approach. To the extent the parties would not be able to resolve the claim of harmful interference, the operator receiving harmful interference would file a written complaint with the Commission. We propose that an ESV network operator, until it has successfully resolved the harmful interference claim, immediately terminate or relocate (to another frequency or distant location) operations on the ESV(s) that is the subject of the complaint when the ESV is within 300 kilometers of the alleged point of interference. We seek comment on this proposal, and invite comment on whether we should adopt further requirements to avoid frivolous complaints. Commenters should also discuss the advantages and disadvantages of our proposal to require an FS/ESV point of contact to attempt to resolve claims of harmful interference before those claims are brought to the Commission.

68. As noted above, we propose a two-year license term for ESV licenses under the proposed Non-Coordination Approach. The operations of ESVs under a Non-Coordination Approach would not be coordinated and would have more potential to cause harmful interference to terrestrial FS operators than the operations that are coordinated with C-band licensees. Thus, it appears appropriate to limit the

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<sup>109</sup> ITU-R Resolution 902 (WRC-03).

license duration under the Non-Coordination Approach. Additionally, because we want to encourage the movement of ESV operations to the Ku-band, we think that shorter license terms might help to achieve that goal. Notwithstanding the proposed two-year license term, ESV operators should expect our normal treatment regarding renewal expectancy of these licenses. While we do not propose to adopt a formal renewal expectancy, we expect to proceed on a case-by-case basis as we have in the context of other satellite services.<sup>110</sup> We seek comment on this proposal.

## 2. Operation on a Coordinated Basis (Coordination Approach)

69. Consistent with our policy of encouraging greater opportunities for spectrum use and in an effort to reduce the administrative burdens associated with granting individual licenses on a case-by-case basis, we seek comment on a C-band ESV licensing approach that would require coordination prior to operation to ensure that present and future terrestrial operations in the C-band would be protected from harmful interference from C-band ESV operations. Under our Coordination Approach, we propose to limit the ESV operator to 36 megahertz of uplink and 36 megahertz of downlink spectrum per satellite, per operator, per location (e.g. port and waterway) over a maximum of two FSS satellites in order to facilitate the coordination of ESVs with FS systems.<sup>111</sup> Under this scenario an ESV operator would be able to coordinate up to 72 megahertz of uplink spectrum (36 megahertz on two satellites) and 72 megahertz of downlink spectrum per location. Based on this approach, we seek comment on whether we should also identify a specific limited portion of the C-band in which all ESVs must operate. We also invite comment on whether and how we should encourage terrestrial FS operations to avoid use of that portion of spectrum, unless there is no other C-band spectrum available for use.

70. Each vessel would need to be 300 gross tons or larger, in accordance with ITU-R JWP-4-9S Recommendations.<sup>112</sup> The minimum ship size limits the impact of ESV operations on FS operations because such vessels are limited in the waterways in which they can travel. The intent of the Coordination Approach would be to mitigate the potential for ESV operations to cause harmful interference to FS receivers particularly those used for public safety and critical infrastructure purposes. Under the Coordination Approach, the ESV operator would not be required to provide real-time access to tracking data. Instead the ESV operator would maintain vessel tracking data for a 90-day period of time and make the data available to the Commission or the frequency coordinator within 72 hours upon request. Also, a license term of fifteen years would apply to ESVs under this approach. We seek comment on whether some other restriction is necessary to limit or prohibit ESV operation on more inland waters, where FS operations may be more numerous and may occur from more directions relative to the vessel.

71. To date, the National Spectrum Managers Association (NSMA)<sup>113</sup> has failed to get

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<sup>110</sup> See, e.g., *In The Matter Of Amendment Of The Commission's Rules To Establish Rules And Policies Pertaining To A Mobile Satellite Service In The 1610-1626.5/2483.5-2500 MHz Frequency Band*, Order on Reconsideration, 11 FCC Rcd 12,861, 12878 ¶51 (1996).

<sup>111</sup> C-band satellite transponders generally have a bandwidth of 36 megahertz.

<sup>112</sup> ITU-R Recommendation SF. 1585.

<sup>113</sup> The NSMA is a voluntary association of individuals whose work spans microwave and satellite engineering, frequency coordination and licensing. Individuals' participation in NSMA is supported by companies from virtually all sectors of the spectrum industry. The NSMA's mission is to address inter-system interference and frequency coordination issues of common interest, to supplement the Commission's coordination-related regulations with (continued....)

representatives of both ESV and fixed service providers to agree on how coordination should be achieved between ESVs in-motion in coastal areas and nearby FS facilities. As stated above, the parties were able to agree on much of the coordination methodology, but they failed to reach an agreement on the interference criteria that would establish an acceptable impact on FS systems. We seek comment on the areas within which ESV and fixed service providers reached agreement during this NSMA effort and also specifically request comments on the interference criteria or objectives for in-motion ESV coordination and the impact on the fixed services. Also, as noted above, ITU-R JWP 4-9S began the development of recommendations for ESV operations with attention to potential interference on FS operations. We seek comments on the methodologies that began in the NSMA forum and have evolved in the ITU-R study group process. NSMA has pointed out in the record to this proceeding that, while some aspects of these recommendations are similar to the earlier methodologies and widely agreed to, others may not be.<sup>114</sup> We seek comment on all aspects of these efforts by the NSMA and the ITU-R study group, including the appropriateness of the methodologies and assumptions, and of the in-motion interference objectives.

72. Under the Coordination Approach, an applicant for C-band ESV authority would complete frequency coordination to access a maximum of two satellites (instead of pointing to all visible satellites) and a maximum of 36 megahertz of spectrum, per satellite, in the uplink direction instead of the 500 megahertz that is available to the regular FSS.<sup>115</sup> This results in the possibility that, under specific geographic configurations, a future FS station may be able to operate nearer to the area of ESV operation without requiring the ESV operator to relocate to another channel. The coordination would be conducted in accordance with Section 25.203 of our rules.<sup>116</sup> Under the Coordination Approach, we intend to meet the current requirements of ESVs operating in the C-band and accommodate future FS and ESV growth in the C-band by minimizing the effect of frequency coordination on those operations.

73. We propose to adopt a coordination process in the C-band that is consistent with Resolution 902 and Recommendation 37. We seek comment on this proposal. As noted above, WRC-03 has: (1) identified the C-band and Ku-band as the frequency bands for operation of ESVs;<sup>117</sup> (2) identified 300 kilometers for C-band operations and 125 kilometers for Ku-band operations as the minimum distance from the coastline beyond which in-motion ESVs would not cause unacceptable interference to FS;<sup>118</sup> (3) provided a model for determining the composite area where potential interference to FS stations from ESVs could exist when the ESV is operating within the coordination distance;<sup>119</sup> and (4) outlined a less

(Continued from previous page)

technical and procedural recommendations to the industry and, on occasion, to offer comments to the Commission based on NSMA consensus on coordination-related issues. NSMA Reply at 1-2.

<sup>114</sup> NSMA Reply at 2.

<sup>115</sup> See 47 C.F.R. § 25.115(c)(2). The coordination must be conducted in accordance with 47 C.F.R. § 25.203.

<sup>116</sup> See 47 C.F.R. § 25.203.

<sup>117</sup> See ITU-R Resolution 902 (WRC-03)

<sup>118</sup> See ITU-R Resolution 902 (WRC-03), Annex 1.

<sup>119</sup> See ITU-R Recommendation SF. 1585. MTN and Comsearch, in a sample report filed by MTN as an ex parte in this proceeding, used the ITU's example approach for the determination of a composite area within which interference to fixed service stations from ESVs, when operating in-motion near coastline, would need to be coordinated. Letter from Raul Rodriguez, Counsel to MTN, to Marlene Dortch, Secretary, Federal Communications Commission, IB Docket 02-10 (dated Nov. 7, 2002).

complicated approach for determining potential interference from ESVs to FS when ESVs are within the Composite Area (*i.e.* the Critical Contour Point Method).<sup>120</sup> We seek comment on the coordination approach that is recommended by the WRC-03, and we specifically seek comment on whether to model a coordination process on the recommendations for C-Band ESVs. Below, we seek comment on certain specific parameters contained in the WRC-03 Recommendations.

74. *Minimum Distance.* Consistent with Annex 1 to Resolution 902, we propose to apply our rules to all C-band ESV operations within 300 kilometers of the U.S. coast. We invite comment, however, on whether we should use the 300 kilometer minimum distance, or some other distance, as a coordination distance from the U.S. coast given the additional limitations we propose to apply to ESV operators.<sup>121</sup> Although the WRC-03 established 300 kilometers as the distance beyond which ESV stations will not have the potential to cause unacceptable interference in the C-band, we recognize that countries that license ESVs might have coordination distances that are greater than or less than 300 kilometers. We therefore seek comment on what other distances might be appropriate in the U.S. context. Commenters should address how the experience of ESV operation in other countries might apply to the United States. Would using a coordination distance of 300 kilometers unnecessarily burden ESV operators or overly protect existing FS users?

75. We note too that ESVs were originally permitted to operate in the C-band on a waiver basis outside 100 km, but were later permitted to operate while traveling to and from certain ports. MTN has indicated that there has been only one substantiated complaint of harmful interference from ESV operations reported to the Commission.<sup>122</sup> In the original waiver permitting ESV use of C-band, IB and OET noted that “[t]he mobile nature of [ESVs] makes it extremely difficult to prevent harmful interference and to identify the interference source.”<sup>123</sup> FWCC maintains that it is difficult to identify the source of interference potentially caused by ESVs because of their mobility and the lack of timely data to identify and track moving interferers.<sup>124</sup> We seek comment on the costs and benefits associated with using a coordination distance that is more than 100 kilometers in the C-band. Additionally, regardless of the minimum distance that is ultimately chosen, we expect that ESV operators will use the most up-to-date navigation charts to calculate that distance from U.S. coastline and modern technology to track ship locations. Furthermore, we seek comment on how to consider the case where the minimum distance from the U.S. coastline is within the minimum distance of another administration (*e.g.* Canada, Mexico, or the Bahamas). In these cases, it is anticipated that the ESV operations with respect to U.S. FS licensees would operate consistent with the coordination completed in the United States to protect FS licensees. For example, a U.S.-licensed ESV may operate under a Coordination Approach with respect to U.S. FS licensees but have Non-Coordination status with respect to Mexican FS licensees. Once an agreement is in place with a foreign administration, the ESV operator would abide by the agreement reached. We seek comment on this matter. Furthermore, we seek comment on how we should consider fixed microwave links that extend into the Gulf of Mexico, for example, that could be within 300 km of an ESV that is located more than 300 km from the U.S. coastline.

<sup>120</sup> See ITU-R Recommendation SF. 1585.

<sup>121</sup> MTN Comments at 23; Intelsat Comments at 4; Inmarsat Comments at 6; Boeing Comments at 2.

<sup>122</sup> MTN Comments at 23; Intelsat Comments at 4; *see also* Boeing Comments at 2-3.

<sup>123</sup> *Crescomm Order*, 11 FCC Rcd at 10949, ¶11.

<sup>124</sup> FWCC Comments at 3.

76. *Composite Area.* If we choose to adopt a coordination distance of 300 kilometers from the coast for ESVs operating in the C-band, under the Coordination Approach, we would require ESV operators to coordinate all potentially interfering operations with FS licensees when the ESVs are within this distance of the U.S. coastline.<sup>125</sup> In order to determine the composite area within which interference to fixed stations from in-motion ESVs should be evaluated, we seek comment on the use of the composite area method developed by the ITU JWP 4-9S and described in ITU Recommendation ITU-R S.1585.<sup>126</sup> In general, the composite area draft Recommendation describes a method that could be used to determine the appropriate areas within which the operation of ESVs must be coordinated with FS receivers when that operation is within a certain distance (*i.e.* 300 kilometers) from the coast of any country.<sup>127</sup> We seek specific comment from the U.S. industries on using these recommendations as a basis for our Coordination Approach. In order to calculate the composite area, certain data elements are required, including a map of the individual vessel's operating contour. As recommended in Recommendation SF. 1585, it is necessary to identify the ESV system parameters such as frequency of operation, maximum transmit power at the input of the antenna, antenna diameter, antenna height above sea level, and velocity of the vessel, to evaluate the interference to the FS from an ESV. The results of the analyses yield the coordination area for the ESV on specified points along its path to and from a port or harbor. These coordination areas are combined to then form the composite area. We seek comment on whether the Commission should collect these data elements in an exhibit attached to the earth station application or whether it would be sufficient for the ESV applicant to provide these data elements to the frequency coordinator and then provide the coordination report as an exhibit attached to the application as proof of successful coordination. If commenters believe that the Commission should collect certain data elements, we seek comment on whether our proposed list is sufficient.

77. *Critical Contour Point.* Under the Coordination Approach, we propose to require ESV operators in the C-band to use the Critical Contour Point Method to determine the potential for interference to FS stations from ESVs. The ITU Joint Working Party 4-9S has developed a recommendation that uses specific points on the ESV operating contour for determining interference to an FS station from emissions from the ESV while it is in motion.<sup>128</sup> The Critical Contour Point Method simplifies the technique for determining potential interference to FS stations by reviewing a small set of points on the ESV operating contour. Each of these points is designated as a critical contour point.<sup>129</sup> For in-motion ESV operations, the Critical Contour Point methodology significantly simplifies the

<sup>125</sup> If we ultimately choose to adopt a coordination distance other than 300 kilometers for ESV operations in the C-band, we would substitute that distance as the distance within which coordination is required for ESV operations in the C-band.

<sup>126</sup> See ITU-R Recommendation SF. 1585.

<sup>127</sup> The potential interference effects from ESVs can be avoided by examining potential interference to receivers operating in the same frequency band located within the composite area determined for the motion of the vessel near the coast. The use of particular frequencies may need to be avoided where the predicted worst-case interference to FS operations on such frequencies exceeds the specified interference criteria. Use of the Composite Area requires knowledge of the limits of the position of the vessel as it approaches land, enters a port or harbor, and proceeds to the vessel's final stationary point at the dock or at anchor. Similar limitations must be defined for the ESV operation as the vessel leaves its stationary position in the port and proceeds to the open sea.

<sup>128</sup> See ITU-R Recommendation SF. 1649 for guidance for determination of interference from ESVs to stations in the fixed service when the ESV is within the minimum distance.

<sup>129</sup> See ITU-R Recommendation SF. 1649 Annex 1, paragraph 2.2.

calculations needed to determine whether FS stations within the Composite Area (as described earlier) would experience more than a permissible amount of interference. These critical contour points include those from which the ESV would most likely cause interference to the FS receiver with which the ESV is coordinating.

**78. Interference Criteria.** We seek comment on the effects of interference on FS stations; in particular, we seek comment on the nature of interference to public safety and other critical infrastructure networks. We also seek comment on the appropriate interference criteria to use for ESV coordination. Internationally, ITU Recommendations ITU-R SF.1006 and ITU-R SM.1448 are available to assess the potential for interference from a stationary ESV. We noted earlier that FS and FSS fixed and temporary fixed earth station coordination has been successfully conducted in the United States for several decades. Our Part 25 and Part 101 rules provide for such coordination. Coordination of in-motion ESVs, however, does not fall within existing interference coordination parameters. We seek comment on what interference criteria to incorporate into Part 25 and Part 101 of our rules for ESVs operating while in-motion. Interference coordination parameters evaluate both short-term and long-term interference criteria. Should ESVs be required to meet both short-term and long-term interference criteria? For example, because ESVs are in-motion, any harmful interference that may be caused would presumably be short-term and would terminate once the ESV has moved out of interfering distance; however, to the extent the vessel on which the ESV operates is on a recurring itinerary, the potential harmful interference could have long-term effects. What would be the basis for applying either of these criteria? In the absence of specific criteria to use for in-motion ESV coordination, we seek comment on whether and how to apply the interference criteria contained in current technical standards used by the FS and FSS industries to conduct coordination among fixed stations and fixed earth stations. The interference criteria contained in Telecommunications Industry Association (TIA) Technical Standards Bulletin 10-F (TSB10-F),<sup>130</sup> for example, could be applied in a way that assumes the ESV equipped vessels were fixed at multiple points along the operating contour. We seek comment on the applicability of current interference criteria for fixed earth stations to ESV coordination.

**79.** Should the Commission decide to permit ESV operations in the C-band, we seek general comment on whether ESVs can operate under similar conditions that apply to fixed C-band small aperture terminals (CSATs).<sup>131</sup> Specifically, we seek comment on whether a C-band ESV operator should be limited to accessing two satellite orbital locations within the visible geostationary satellite arc,<sup>132</sup> and 72 megahertz of C-band spectrum per satellite (uplink and downlink combined), per location (e.g. port, harbor, and navigable waterway). Under the current CSAT rules, a CSAT operator is limited to accessing three satellite orbital locations and 40 megahertz of spectrum (uplink and downlink

<sup>130</sup> See Telecommunications Industry Association (TIA) Technical Standards Bulletin 10-F (TSB10-F), dated June 1994.

<sup>131</sup> In May 2001, the Commission amended Part 25 of its rules to allow operators the option of obtaining licenses for a limited class of small aperture terminal earth station networks in the C-band (CSATs) under a single authorization. See *FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service That Share Terrestrial Spectrum*, Report and Order, 16 FCC Rcd 11511 (2001) (*CSAT Order*), terminating proceeding, *FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service that Share Terrestrial Spectrum*, Second Report and Order, 17 FCC Rcd 2002 (2002) (*Second CSAT Order*).

<sup>132</sup> The visible geostationary arc is that portion of the geostationary orbit where line of sight from the earth station to the space station is achieved at the desired elevation angle.

combined). We are proposing that more spectrum (72 megahertz) be made available for C-band ESV networks because this corresponds with current ESV network use and reflects the bandwidth of a full C-band satellite transponder. While CSATS are often located in remote areas that are far away from terrestrial FS operations, ESVs may be operating near more densely-populated areas that are closer to terrestrial FS operations. Accordingly, we are proposing to limit ESV operations to two satellites to limit the potential for harmful interference.

80. We seek comment on these limitations for the following reasons. First, the mobility of an ESV creates a larger coordination area than for a fixed earth station. That is, the Composite Area covers much more area than any of the single coordination areas making up the Composite Area and therefore more FS stations would be included in the ESV coordination. Limiting the amount of spectrum used by the ESV operator in the Composite Area would compensate for the larger coordination zone because the population of FS stations operating on the same 36 megahertz of spectrum as the ESV would be less than the population of FS stations permitted to operate over the entire 500 megahertz of bandwidth. Coordination would therefore be more manageable, and resolution of potential harmful interference easier, by placing limitations (*i.e.* the same as those applied to CSATs) on the number of satellites that can be accessed and the amount of spectrum that can be used by the ESV operators.

81. Second, the limitations would help to ensure FS operators have opportunities for future growth in the band without disrupting ESV operations if the ESV operation were constrained to certain coordinated portions of the frequency band.<sup>133</sup> The Commission found in its *CSAT Order* that if it applied its policy of authorizing the entire 1000 megahertz of C-band spectrum with access to all visible GSO satellites (*i.e.* full band - full arc), under such a licensing approach, it could have a significant negative effect on the ability of terrestrial fixed services to coordinate successfully spectrum for use in the future.<sup>134</sup> Our approach would allow ESV operators access to 36 megahertz uplink and 36 megahertz downlink spectrum for each of two satellites at a particular port or harbor.<sup>135</sup> Without this limitation, ESV operators, in theory, could request authorizations for the entire 1000 megahertz of C-band spectrum with access to all visible geostationary satellites (full band - full arc). Such a request could exacerbate frequency coordination difficulties in the band by precluding the ability of an FS operator to coordinate use of the same channels coordinated for ESVs but where the FS operations would not impact ESV operations.<sup>136</sup> Our proposal seeks to minimize frequency coordination concerns by placing limits on C-band ESV networks. We seek comment on this proposal. Current C-band ESV operations by a network operator involve a full 36 megahertz satellite transponder; accordingly, we seek comment on minimizing frequency coordination concerns through a limitation on spectrum access in bandwidth and orbital arc. Is 36 megahertz of spectrum in the uplink direction, per satellite, per location, per operator adequate for the services that ESV operators want to provide? Is it too much? Commenters should fully support with factual data the position they take with respect to the amount of spectrum that should be permitted.

82. Under the current coordination process used for co-primary fixed and fixed-satellite earth

<sup>133</sup> See *CSAT Order*, 16 FCC Rcd at 11519, ¶17.

<sup>134</sup> *CSAT Order*, 16 FCC Rcd at 11519, ¶17.

<sup>135</sup> Section 101.147(i) lists the various center frequencies and states that authorized bandwidth can be either 400 kHz, 800 kHz, 1.25 MHz, 2.5 MHz, 3.75 MHz, 5 MHz, 10 MHz, or 30 MHz bandwidth channels. 47 C.F.R. § 101.147(i). Having this information should assist in the coordination process for C-band ESVs.

<sup>136</sup> See MTN Comments at 17, n.25. See also *CSAT Order*, 16 FCC Rcd at 11519, ¶17.

stations, once a channel is coordinated, the operator has the right to operate on the channel throughout the license term of the station and future stations must protect any previously-authorized station. On the other hand, operations with non-interference basis status, such as those under Part 15 of our rules, have no spectrum rights relative to services with secondary or primary allocations and are not usually coordinated because coordination implies protection from future authorizations. Here we are proposing a new scenario, where ESV operations – which may not cause harmful interference to, claim interference protection from, nor otherwise impose constraints on the operation or deployment of other radio services in the C-band<sup>137</sup> -- may be coordinated. We believe that there is benefit in encouraging coordination of ESV operations in the C-band in that it significantly reduces the likelihood that harmful interference will occur. Accordingly, we invite comment on whether ESV operators that go through the coordination process can be provided with some level of certainty that their operations can continue even if an FS station is constructed after the coordination is completed. We invite suggestions on how this might be done. For example, should we encourage frequency coordinators to avoid assigning new FS operations to frequencies coordinated for ESVs unless there is no alternative available?<sup>138</sup> Should we require that a specific showing be made in this regard? What burden would such a requirement for a showing of need place on FS operators? What incentive would ESV operators have to coordinate spectrum under this approach if future FS licensees could require ESV operators to release a particular channel in a particular harbor or waterway without a showing of need? How would this level of uncertainty affect the ESV operator's ability to conduct its business? While the Commission is interested in protecting the interests of the incumbent services, including their business and future growth interests, the Commission would like to encourage the ESV operators to follow the Coordinated Approach, where possible, by providing certain benefits.

83. We seek comment on whether the procedures discussed above are sufficient to protect terrestrial FS operators from harmful interference and to prevent primary FS operations from being frozen from growth in some areas. We also seek comment on other cost-effective alternatives that might provide protection against harmful interference being caused to FS operations and still permit operation of ESVs in the C-band. For example, is it possible for an FS operator and ESV operator to timeshare coordinated spectrum? Although ESV operators seek authority to occupy a certain portion of the spectrum, that spectrum would not be in constant use at a particular port or waterway due to the mobile nature of ESVs.<sup>139</sup> It is possible, therefore, for spectrum coordinated for ESV use in each port to remain idle for periods of time. Could the spectrum be used by an FS operator when it is not being used by an ESV? How would a timesharing process work? This concept would require that FS and ESV operators share detailed information about their usage patterns. Furthermore, the spectrum would have to be coordinated. Who would pay for the coordination? Could coordination be done on an automated basis? Is there technology available at reasonable cost to facilitate such an activity? Would the FS and ESV operators split the costs? We seek comment on the feasibility of timesharing and on the legal authority to

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<sup>137</sup> WRC-2000 Resolution 82 specifies that ESV operations "shall not cause harmful interference to, claim protection from, or otherwise impose constraints on the operation or development of other radio services" operating in the bands. The U.S. position to WRC-03 supported these constraints on ESV operations.

<sup>138</sup> Under the Coordination Approach, the FS operator would know what channels will be used by ESVs in a particular area and know that each ESV operator is limited to a maximum of 72 MHz (36 MHz times two satellites) out of a total 500 megahertz available in the uplink direction of transmission.

<sup>139</sup> In the *MTN Order*, the Bureau determined that, in the case where the ESV operator sought to license its ESVs as fixed earth stations while the ships carrying the ESVs are at port and stationary, such ESVs would be most reasonably licensed as temporary-fixed earth stations. *MTN Order*, 15 FCC Rcd at 23214-15 ¶¶ 21-25.



condition licenses with timesharing requirements. We also seek comment on any other alternatives that commenters can develop. Is it possible to operate ESVs in portions of the C-band that are not heavily used by FS stations? Do such portions of the spectrum exist in or near the port areas sought by ESV operators? If so, should ESV operators concentrate on coordinating that portion of spectrum first? Should ESV transmissions be limited to a specific frequency polarity to facilitate coordination with FS operators? Or, would such a requirement overly burden the ESV operator? If so, why? We also seek comment on whether to apply our approaches to earth stations on oil rigs and other fixed platforms at sea. How should these types of ESVs be processed? Would it be more appropriate to license platforms as temporary fixed earth stations if the earth station is not operating while the platform is in motion?

### 3. Provisions Applicable to both the proposed Non-Coordination and Coordination Approaches in the C-band

84. Should the Commission decide to permit ESV operations in the C-Band under a Non-Coordination or a Coordination Approach, we seek comment on whether to amend Sections 25.115 and 25.134 of our rules to permit licensing of ESV operations in the C-band. Currently, the licensing provisions in Part 25 permit licensing of fixed CSATs, but they do not accommodate ESV networks.<sup>140</sup> We seek general comment on whether ESVs can operate under the same or similar licensing rules used for CSATs.

85. Section 25.115(c)(2) of our rules permits parties to apply for licensing of small antenna network systems for domestic service that operate in the C-band. We seek comment on adding a new subsection to Section 25.115 that would set forth the application procedures for ESVs operating in the C-band.<sup>141</sup> In order to receive authority to operate a C-band ESV system under Section 25.115(c)(2), an applicant would be required to file a lead application, as CSAT applicants are currently required to do. An applicant would also have to identify the scope and nature of the service to be provided and give the complete technical details of each representative type of small antenna that would operate within the network.<sup>142</sup> We currently require CSAT applicants to file their applications electronically using the International Bureau Filing System (IBFS).<sup>143</sup> We propose to apply the same electronic filing requirements to ESV applicants, and we seek comment on this proposed requirement.

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<sup>140</sup> See 47 C.F.R. § 25.134. CSAT networks and VSAT networks are similar to each other because they each use a large main hub antenna to communicate by satellite link to a large number of smaller diameter remote earth stations. But, whereas VSATs operate in the Ku-band, CSATs operate in the C-band. This difference is significant because no co-primary terrestrial fixed service allocations exist in the Ku-band in the United States. In the C-band, however, the terrestrial FS and the fixed satellite service (FSS) share spectrum on a co-primary basis. 47 C.F.R. § 2.106. The shared nature of spectrum in the C-band requires prior coordination within the band. Because of this need for prior coordination, in May 2001, the Commission amended Part 25 of its rules to allow operators the option of obtaining licenses for a limited class of small aperture terminal earth station networks in the C-band under a single authorization. *FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service That Share Terrestrial Spectrum*, Report and Order, 16 FCC Rcd 11511 (2001) (*CSAT Order*), terminating proceeding, *FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service that Share Terrestrial Spectrum*, Second Report and Order, 17 FCC Rcd 2002 (2002) (*Second CSAT Order*).

<sup>141</sup> 47 C.F.R. § 25.115.

<sup>142</sup> 47 C.F.R. § 25.115(c)(2).

<sup>143</sup> 47 C.F.R. § 25.115(c)(2).

86. If the Commission decides to adopt a Non-Coordination Approach or the Coordination Approach for ESVs operating in the C-band, Section 25.134 of our rules would also need to be modified to apply specific licensing provisions to ESV network operations.<sup>144</sup> Similar to the Ku-band VSATs, we routinely process applications for CSAT networks that meet the antenna performance standards in Section 25.209 of our rules and that do not exceed the power levels specified in Sections 25.211(d) and 25.212(d) necessary to protect two-degree spaced satellites.<sup>145</sup> Applicants for non-routine operations must submit the ASIA analyses with their application and demonstrate that unacceptable interference to adjacent satellite operators will not occur. We believe that the current antenna standards and power levels for CSATs adequately protect adjacent satellite operators. The licensing procedures on which we seek comment on for C-band ESVs should be equally adequate to protect adjacent satellite operators.<sup>146</sup> We propose that C-band ESV applicants seeking to exceed these limits specified in Sections 25.209, 25.211(d), and 25.212(d) of our rules should be required to file an initial lead application that includes all technical analyses required to demonstrate that the operation of the non-conforming earth stations will not cause unacceptable interference to any potentially affected adjacent satellite operators.<sup>147</sup> Furthermore, we seek comment on whether C-band ESV operators should receive authorizations to operate with any U.S. licensed satellite (*i.e.* ALSAT authority) and non-U.S. satellites on the Permitted List. Or, for reasons relating to potential interference to two-degree spaced satellites, should ESV operators be granted authority to access individual satellites only? We note that ESV characteristics presented in the ITU process identify a 2.4 meter antenna in the interference analyses associated with FS protection. Our rules for routine licensing require an antenna size of 4.5 meters or greater in diameter for two-degree spacing compliance and routine licensing.<sup>148</sup> Moreover, we note that the Commission has proposed rules to address the use of smaller diameter antennas in the C-band.<sup>149</sup> We seek comment on our proposals to use the CSAT licensing approach for C-band ESV networks.

87. We seek comment on whether the proposed Non-Coordination Approach and Coordination Approach can be implemented in a manner that will permit new FS and ESV stations to be developed in a reasonable time and at a reasonable cost. Should ESVs be permitted in bodies of water other than oceans? For example, we seek comment on the 300 gross tonnage limitation we would place on ESVs. Would it preclude ESVs from being used on the Great Lakes or on the largest rivers within the United

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<sup>144</sup> 47 C.F.R. § 25.134.

<sup>145</sup> See 47 C.F.R. §§ 25.209, 25.211(d), 25.212(d). Section 25.211(d) permits routine licensing of earth stations that have diameters of nine meters or less in the 6 GHz band if the maximum power into the antenna does not exceed 450 watts (26.5 dBW), and for earth stations that have diameters of five meters or less in the 14 GHz band if the maximum power into the antenna does not exceed 500 watts (27 dBW). Section 25.212(d) permits streamlined licensing for earth stations in the 6 GHz band that are 4.5 meters in diameter or greater if the maximum power densities into the antenna do not exceed +0.5dBW/4 kHz, and do not exceed -2.7dBW/4 kHz for narrow and/or wideband SCPC carriers. 47 C.F.R. § 25.212(d).

<sup>146</sup> We note, in this regard, that the WRC-03 adopted both off axis-EIRP limits on C-band ESVs to protect adjacent FSS satellite systems. The CSAT rules to which the text refers are more stringent than the limits adopted by the WRC-03 and will provide greater protection to adjacent FSS systems. Therefore, we are proposing that, in order to be granted routine licensing, ESVs must meet the CSAT rules.

<sup>147</sup> 47 C.F.R. § 25.115(c)(2).

<sup>148</sup> See 47 C.F.R. § 25.134(a)(2).

<sup>149</sup> *Part 25 Streamlining Further Notice*, 17 FCC Rcd 18603-04, ¶¶ 42-52.

States? Should we require coordination across all ports and shipping lanes? How might earth station pointing requirements or limitations on the number of satellites viewed by any given earth station affect the geographic area within which ESV operators would be required to operate?

88. Consistent with Resolution 902, under both approaches, ESV networks would be required to have automatic shut-off capability. Specifically, ESV systems should have the capability for automatic mechanisms to terminate transmissions whenever the station operates outside its authorized geographic area or operational limits. This requirement would be consistent with ITU Resolution 902. We seek comment on whether and how the automatic shut-off capability for ESVs would be activated. Also, the 300 kilometer minimum distance from the coast at which point the conditions for the Non-Coordination Approach would apply and at which point the coordination with FS stations would be required under the Coordination Approach, are based on the ESV and FS parameters contained in ITU-R Recommendation SF. 1650. If commenters believe that the distance should be modified in any way for the Non-Coordination Approach or the Coordination Approach, justification should be given based on the ESV and FS system parameters contained in the ITU Resolution 902. Beyond these minimum distances, the Non-Coordination or Coordination Approaches would not apply because interference from in-motion ESVs would not be expected.

89. Perhaps the use of other operational techniques could be applied to reduce the minimum distances from the U.S. coastline under the Non-Coordination Approach and Coordination Approach. For example, we seek comment on the extent to which ESVs would avoid potential harmful interference to FS stations within a shorter distance than 300 km in the C-band and 125 km in Ku-band by (1) incorporating precise antenna pointing capabilities in the ESV network; or (2) using high ESV transmission antenna directivity combined with transmitting only when the antenna azimuth is pointed sufficiently away from land receivers. A byproduct of having a high ESV elevation angle (e.g. 30 degrees) is that harmful interference to low elevation FS receivers (e.g. less than 5 degrees) would be mitigated. We seek comment on whether we should require a minimum ESV elevation angle within the minimum distances from the U.S. coast, and if so what that minimum angle should be. We also seek comment on whether an azimuth angle restriction should be required and why. Comments addressing these additional protections for FS operations should discuss the costs to the ESV operator in implementing these measures and the possible benefits in terms of interference protection for the FS operators that might be affected.

90. The ITU Resolution 902 requires administrations to seek agreements with affected administrations in the C-band. We seek comment on an ESV Coordination Approach to apply in the C-band in the United States and we recognize that other countries may have terrestrial operations in the C-band. We therefore seek comment on what, if any, license conditions should apply to ESV network operators with respect to coordination with foreign administrations.

91. We propose the following rules for ESV networks using the 5925-6425 MHz band. ESV network applications or applications for hub earth station operations will be routinely processed provided: (1) the network employs on board ships antennas that are 4.5 meters or larger in diameter, and that are consistent with Section 25.209; (2) the network's power levels are consistent with Sections 25.211(d) and 25.212(d); (3) the ESVs have antenna pointing accuracies of +/-0.2 degrees or better; and (4) frequency coordination, where necessary, has been satisfactorily completed. The use of smaller antennas or non-consistent power levels require the filing of an initial lead application that includes all technical analyses required to demonstrate that unacceptable interference will not be caused to any

affected adjacent satellite operators by the operation of the non-conforming earth station.<sup>150</sup> We seek comment on these proposed rules for C-band ESV operations.

92. We seek comment on two approaches to licensing ESV networks in the C-band. The first approach would provide a two-year license for C-band ESV operations on a non-coordinated basis, but with strict requirements for ESV tracking and resolution of claims of harmful interference and a short-term authorization period. The second approach would provide a fifteen-year license for C-band ESV operations that are frequency coordinated and operate under certain technical requirements that are designed to reduce the potential for harmful interference to terrestrial FS systems. We also seek comment on whether applicants for C-band ESV licenses should have the option of choosing whether their ESVs would be authorized under either, or both, of these approaches.<sup>151</sup>

93. Licensing ESV operations in the C-band would reduce administrative burdens by eliminating the current system of authorizing ESV operations with six-month STAs, which results in longer overall processing times. We seek comment on whether a two-year license term for C-band ESVs under the Non-Coordination Approach and a fifteen-year license term for C-band ESVs under the Coordination Approach are reasonable and consistent with other licensed networks of earth stations.<sup>152</sup> ESV proponents argue that shorter terms would undermine the stable regulatory regime that ESVs require, and would also stifle investment in the industry.<sup>153</sup> FWCC argues for "relatively short" license terms for ESVs. FWCC states that the recurring need for renewal would provide an incentive for ESV operators to cooperate in the resolution and prevention of interference. FWCC also states that short license terms would prevent ESV operators from "tying up" the band for long periods of time.<sup>154</sup> In this regard, we seek comment on whether monitoring of ESV operations is possible without imposing a shorter license term. To the extent that ESV operators coordinate their ESV operations, thereby reducing the potential to cause harmful interference to terrestrial FS operators, is it not appropriate to grant ESV operators longer license terms? Given our proposed two satellite and 72 megahertz per satellite (uplink and downlink, combined), per operator, per location requirement and proposed coordination provisions, are shorter license terms necessary to protect against harmful interference to terrestrial FS operators or to prevent ESVs from occupying the band for long periods of time? We also seek comment on whether we could authorize coordinated and non-coordinated ESV operations under a single license. Would a single license be possible if coordinated and non-coordinated ESV networks receive different license terms?

#### **D. Provisions Applicable to ESV Operations in both the C-band and the Ku-band**

94. *Tracking ESVs.* In the *Notice of Inquiry*, the Commission sought comment on the requirement of real-time tracking of ESVs through use of the Global Positioning System (GPS) as a method to identify harmful interference from an ESV to FS receivers on the coast. The Commission also sought comment on making this type of location data on the Internet for public inspection. We generally

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<sup>150</sup> See 25.115(c)(4), as proposed in the Appendix.

<sup>151</sup> For example, some operators may desire to use the Coordination Approach in ports and locations where this is feasible, and the Non-Coordination Approach in other locations.

<sup>152</sup> 47 C.F.R. § 25.121.

<sup>153</sup> MTN Reply at 21; *see also* MTN Comments at 21; Hughes Comments at 3.

<sup>154</sup> FWCC Comments at 12-13.

agree with the commenters who state that this information should not be made publicly available.<sup>155</sup>

95. The C-band ESV coordination requirements on which we seek comment in this *Notice* are intended to remove the potential for harmful interference from ESVs to the FS. To the extent that the Coordination Approach does not eliminate all circumstances of harmful interference from ESVs, we seek comment on the need to track ESV operations. A necessary part to coordination has always been the knowledge of exactly where the transmitting and receiving stations are, the frequency channels used and, the exact pointing angles of the antennas, which are crucial criteria for microwave services. Opening the band to ESVs while in-motion requires additional steps to allow proper enforcement. Therefore, an ESV operator following the Coordination Approach would be required to provide the Commission with information about the range of frequencies and specific channels of its ESVs within a geographic contour when it files an application with the Commission. On a going-forward basis, the ESV operators would maintain vessel tracking data for a 90-day period of time and provide the Commission or the frequency coordinator with detailed information on the operating channels of its ESVs in a particular port or waterway within 72 hours upon request. Recognizing that "real time" public access to exact ship location information presents a security risk for the ship, the Commission would not make it public, but would use the operating frequency information provided by the ESV operator for harmful interference resolution and enforcement purposes. The Commission would have a record of where ESVs have operated and, if it receives a complaint of harmful interference, the interference could be eliminated or the ESV operator could be ruled out as the cause for harmful interference. We seek comment on the anticipated effectiveness and utility of this process and whether a trial period could be implemented to gain experience with the process. We also seek comment on whether this process would be adequate to protect public safety and other critical users of the C-band spectrum from harmful interference.

96. Where ESV operations are not licensed under the Coordination Approach (*i.e.* for Ku-band and Non-Coordination C-band operations) the ability to track ESVs in real time would present FS, space research and radio astronomy operators with an opportunity to identify a potentially interfering ESV and take immediate steps to have the harmful interference resolved, including through termination of the ESVs operations, if necessary. We understand that GPS is often used to track the location of ESVs. We seek comment on whether a password-protected web site would be a secure enough method to post real-time location information on ESVs. We also seek comment on whether ESV operators should be required to make exact ship location information accessible, in a secure fashion, to individual operators in the C-band and Ku-band so that they can identify a potentially interfering ESV, or should ESV operators be required to make this information accessible to a third-party, single point of contact representing commercial or government agencies? Working through a single, third party entity may provide a more secure and controlled environment for exchanging the necessary location information to isolate instances of harmful interference. We seek comment on other methods that may be used to track precisely ESVs that might provide greater specificity of location information without posing a security risk to vessels, their passengers, and crews. We have concerns that real-time tracking of all the vessels, commercial and government, and making that information public, could present a situation where the information will be too sensitive to be released. We will consider all alternative methods for identifying harmful interference sources in a secure and controlled environment.

97. *Harmful Interference to FS Stations.* Based on the record developed in this docket and information the Commission has gathered since 1992 on the operation of ESVs under STAs, interference from ESVs into terrestrial FS licensees appears unlikely when the ESVs are operated within the

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<sup>155</sup> MTN Comments at 25; MTN Reply at 19-20; Harris MCS Comments at 4.

parameters of the STAs.<sup>156</sup> In the past decade, terrestrial FS licensees have filed only one documented interference complaint with the Commission against MTN, the only authorized operator of ESVs in the United States.<sup>157</sup> FWCC, however, states that “the transient nature of the moving vessel makes the task of tracking down and confirming the source almost impossible” and that “[a]n ESV could cause interference sufficient to disrupt a vital FS communications link, only to move on and never be traceable as the source of the interference.”<sup>158</sup> Although the number of authorized ESVs has been relatively small, the mitigation measures described above are designed to prevent harmful interference to terrestrial FS incumbents regardless of the number of ESVs authorized. Yet, to better understand the potential for interference from licensing ESVs, we seek comment on, and request documentary evidence of, any incidents of interference from authorized ESV operations to FS or any other type of operations. We have already noted that the original Crescomm waiver indicated the extreme difficulty in identifying an ESV as an interferer, because they are moving emitters. Accordingly, we seek to understand the prevalence of harmful interference to FS stations from unknown and known sources and the statistical, intermittent nature of interference to FS systems. For instance, we seek information on how many reports of potential interference FS operators have filed with ESV operators since 1992, when ESV service was initiated, whether or not MTN may have denied responsibility. We seek comment on how any of the interference complaints have been addressed and resolved. It is possible that some entities have operated ESVs in U.S. waters but have not approached the Commission for regulatory authority. Without some form of identification, it is difficult to determine who may be the interferer. Have FS operators filed any additional reports of interference with ESV operators since the initiation of this proceeding? Commenters should explain how those reports of interference were resolved. What, if any, measures did the ESV operators take to resolve the FS operators concerns?

98. We also seek comment on whether there are any other technological measures that could be implemented to address potential concerns about intermittent harmful interference (possibly due to the vessel's motion and sailing schedule) to FS stations sharing the frequency bands. For instance, should ESV operators be required to place identification tags in its ESV transmissions to identify the ESV operator and the vessel? Would such a requirement be necessary in all cases? The intent of the Coordination Approach is to mitigate the potential for harmful interference from ESVs to terrestrial FS operators. Would the Coordination Approach discussed earlier make it easier to identify potentially interfering ESVs and obviate the need for additional measures such as transmission identification? We seek comment on the cost and benefits associated with this and any other operational requirement to identify potentially interfering ESVs.

99. We additionally seek comment on how harmful interference could be resolved under the two approaches to C-band ESV licensing we discuss above. Typically, transmitters that operate on a non-harmful interference basis are required to cease operating the device upon notification by a Commission

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<sup>156</sup> Letter from Steve Sharkey, Chief, Satellite Engineering Branch, Satellite and Radiocommunication Division, International Bureau, to Robert G. Allen, Counsel for MTN (dated Feb. 13, 1997).

<sup>157</sup> MTN Comments at 7. The complaint alleged interference from cruise ships in Alaska's inland passage near Juneau during two months in Summer 2000. Letter from Mitchell Lazarus, Counsel for FWCC, to Eliot J. Greenwald, Counsel for MTN (dated May 1, 2001). MTN maintains that in response to the complaint, it demonstrated that the alleged interference could not have been caused by its ESV systems. MTN Comments at 7.

<sup>158</sup> FWCC Comments at 3-4.

representative that the device is causing harmful interference.<sup>159</sup> We have proposed, however, a number of requirements for ESVs that should reduce the likelihood of harmful interference and allow the interfering operation to be identified if harmful interference does occur. Accordingly, we propose that if harmful interference occurs under the Non-Coordination approach, the FS operator would contact the designated FS point of contact and provide a full description of the interference event. The FS point of contact would then report the interference event to the ESV operator's point of contact. The ESV operator would be required to terminate immediately or relocate (to another frequency or distant location) operations on the ESV(s) that are the subject of the complaint when the ESV is within 300 kilometers of the alleged point of interference until the ESV operator has successfully resolved the harmful interference claim. We seek comment on this proposal, and invite comment on whether we should adopt further requirements to avoid frivolous complaints. If harmful interference occurs under the Coordination Approach, the parties would be expected to cooperate in resolving the interference in the same fashion as for other situations when coordination had previously been successfully completed. Specifically, if a FS licensee receives harmful interference from an ESV licensee, the parties involved would comply with the following dispute resolution procedure: (1) the licensee experiencing the harmful interference would notify the licensee believed to be causing the harmful interference and would supply information describing its problem and supporting its claim; (2) upon receipt of the harmful interference notice, the licensee alleged to be causing the harmful interference would respond immediately and make every reasonable effort to identify and resolve the conflict; and (3) the licensees would be encouraged to resolve the harmful interference prior to contacting the Commission.<sup>160</sup> We seek comment on whether this process for resolving harmful interference would be sufficient given that vessel tracking information would be made readily available to FS operators.

#### **E. Vessels of Foreign Registry near U.S. Coasts and Vessels of U.S. Registry near Foreign Coasts**

100. As discussed in greater detail below, we seek comment on whether U.S.-licensed ESV hub operators should only be authorized to communicate with ESVs on (a) U.S.-licensed vessels in the Ku-band and C-band (either under the Coordinated or Non-Coordinated Approach); (b) vessels of foreign registry that are licensed by that nation, that have been the subject of an agreement between that nation and the United States per the WRC-03 decision, and that are real-time tracked; and (c) vessels of foreign registry that have been authorized by foreign administrations to operate on a strictly non-harmful interference basis within the minimum distance, provided that all of the Commission's technical rules are met where there is no bilateral agreement with a particular foreign nation. MTN currently provides ESV service in various parts of the world in both the Ku-band and the C-band. Most of the ships to which MTN provides service are foreign-flagged vessels. The Commission does not have the authority to license individual ESVs on foreign-flagged ships. Foreign-flagged vessels also do not have authority under the ITU Radio Regulations to operate ESVs unless they have been licensed by the administration through which the vessel is registered.<sup>161</sup> Furthermore, Recommendation 37 encourages agreement between the administrations licensing ESVs and affected administrations.<sup>162</sup> As explained below, the

<sup>159</sup> See, e.g., 47 C.F.R. § 15.5(c), which also specifies that such operation shall not resume until the condition causing the harmful interference has been corrected.

<sup>160</sup> See 47 C.F.R. § 101.105(e)(1-3).

<sup>161</sup> See ITU RR 4.4, RR 18.1.

<sup>162</sup> To date, the United States has not been approached to have and has not held discussions towards reaching an agreement with another administration in this regard.

Commission does have authority to adopt regulations to protect its licensed radiocommunication systems, including terrestrial fixed FS and other services, from receiving harmful interference from ESVs on foreign-flagged vessels. Consistent with the decisions reached at WRC-03, we seek comment on procedures for arriving at agreements between the United States and foreign administrations on measures to protect terrestrial services authorized in the C-band and Ku-band, and for the proper enforcement of the agreements.

101. In the *MTN Order*, the Bureau granted MTN's STA extension request with respect to six U.S.-flagged vessels<sup>163</sup> and denied its request with respect to thirty-four vessels of foreign registry.<sup>164</sup> The Commission noted that, pursuant to Section 306 of the Communications Act, the Commission does not have jurisdiction to license ESVs on foreign vessels.<sup>165</sup> Thus, ESVs on board vessels of foreign registry cannot be licensed under the licensing procedures that we propose in this *Notice*. We recognize that most of the vessels currently served by C-band ESV operators are vessels of foreign registry. We therefore seek comment on how the Commission should treat ESVs that are located on foreign vessels. If a U.S.-licensed ESV operator is permitted to serve ESVs on U.S.-flagged vessels in certain U.S. waterways and ports, should we permit that ESV operator to serve ESVs on non-U.S.-flagged vessels if there is a bilateral agreement covering ESV operations between the United States and the administration of the vessel's registry? If we take this approach, should we require that the ESVs on non-U.S. vessels be technically and operationally identical to those already authorized for U.S.-flagged vessels in order to qualify for these procedures? We seek comment on whether to hold responsible the hub earth station licensee that controls the ESV network for resolving any harmful interference that may be caused by serving non-U.S.-flagged vessels. We believe that U.S. licensees of the hub earth station should know whether an ESV station is on a ship authorized by the United States or on a foreign-flagged vessel and subject to a bilateral agreement. Would it be sufficient to require the ESV network operator to terminate transmissions from or refuse service to ESVs that are not compliant with Commission rules and policies?

102. We also seek comment on whether, as proposed by FWCC, we should prohibit the U.S. licensee of an ESV network from communicating with any ESV station within the identified minimum distances if the ESV is not part of the ESV network licensed by the Commission or, in the case of a vessel of foreign registry, is not the subject of a bilateral agreement between the United States and the country of registry. Is the FWCC proposal consistent with ITU Recommendation 37 in the first instance, and if so, is it too restrictive for the case where an ESV operates within a network where the hub is located in the United States, and the network is licensed by the Commission, but there exists no bilateral agreement between the United States and the country of registry for certain of the vessels? Would it suffice in this case for ESV operations to be permitted on a non-harmful interference basis within the minimum distance provided that all of the Commission's technical rules are met? We also seek comment on licensing of ESVs on board U.S.-flagged vessels that will travel on the high seas or near the coast of other countries. What, if any, conditions should apply to the operations of such ESVs?

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<sup>163</sup> *MTN Order*, 15 FCC Rcd 23210 at 23215-16, ¶12.

<sup>164</sup> *MTN Order*, 15 FCC Rcd at 23214-15, ¶9.

<sup>165</sup> *MTN Order*, 15 FCC Rcd at 23214-15, ¶9. Under Section 306 of the Communications Act, the Commission does not have authority to license earth stations on vessels of foreign registry. 47 U.S.C. § 306; see also *MTN Order*, 15 FCC Rcd at 23214-15, ¶9.



## F. Foreign-licensed ESV Operators

103. As noted above, pursuant to Section 306 of the Communications Act, the Commission does not have jurisdiction to license ESVs on foreign vessels.<sup>166</sup> Section 306 does state, however, that radio communications and signals from radios on foreign ships must be transmitted in accordance with U. S. regulations designed to prevent interference.<sup>167</sup> We seek comment on the treatment of ESVs that operate within a network where the hub is located outside of the United States and is licensed by a foreign country. To the extent those ESVs are on ships of foreign registry, how should they be treated when they operate within the minimum distances? We note that under Resolution 902, Annex 1, "[a]ny transmissions from ESVs within the minimum distances shall be subject to the prior agreement of the concerned administration(s)," and that the United States is a concerned administration in the 5925-6435 MHz and 14.4-14.5 GHz bands.<sup>168</sup> We also note that noting a) of Resolution 902 states that ESVs may be assigned frequencies to operate in FSS networks in the bands 3700-4200 MHz, 5925-6425 MHz, 10.7-12.75 GHz and 14-14.5 GHz pursuant to No. 4.4 of the Radio Regulations and shall not claim protection from, nor cause interference to, other services having allocations in these bands.<sup>169</sup> With these statements in mind, we seek comment with respect to our treatment of ESVs on ships of foreign registry that communicate with a hub outside the United States. Should we permit ESVs on ships of foreign registry to operate in the 5925-6425 MHz or 14.4-14.5 GHz band within the minimum distances of the United States only when (1) the ESV itself is licensed by a foreign administration that has a prior agreement with the FCC; or (2) a foreign administration has authorized the ESV to operate on a non-protected, non-interference basis subject to No. 4.4 of the ITU Radio Regulations? Should we permit ESVs on ships of foreign registry transmit in the 14.0-14.4 GHz band within 125 km of the United States only if (1) the ESV complies with the provisions of Resolution 902 and the annexes thereto, or (2) the ESV has been authorized by a foreign administration to operate on a non-protected, non-interference basis subject to No. 4.4 of the ITU Radio Regulations? We also seek comment on whether in the absence of a bilateral agreement between the United States and the other licensing administration, such ESV operations should be required to shut off transmissions when the ESVs are within the minimum distances of the United States. Or, would it be appropriate for these ESVs only to shut off ESV transmissions within the minimum distance if the ESV is operating outside the technical and operational limits established for routine processing of ESV licenses in Section 25.134?<sup>170</sup> In the absence of an agreement, what should be the status of ESVs on vessels of foreign registry in the U.S. context?

104. We also seek comment on the applicability of our proposed rules to foreign-licensed network operators. For example, our proposals require that satellites used in an ESV network be authorized to serve the United States. ESV network operators that choose to communicate with non-U.S.-licensed satellites would be required to provide a case-by-case *DISCO II*<sup>171</sup> showing in order to

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<sup>166</sup> See 47 U.S.C. § 306.

<sup>167</sup> See 47 U.S.C. § 306.

<sup>168</sup> ITU-R Resolution 902 (WRC-03) Annex 1.

<sup>169</sup> ITU-R Resolution 902 (WRC-03).

<sup>170</sup> Section 25.134 of our rules authorizes routine licensing for VSAT and CSAT networks that meet certain technical parameters. See 47 C.F.R. § 25.134.

<sup>171</sup> See *Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Satellites Providing Domestic and International Service in the United States*, Report and Order, IB Docket No. 96-111, 12 FCC Rcd (continued....)

receive authorization to access non-U.S. satellites. We seek comment on whether such proposed rules for U.S.-licensed ESV network operators should apply to foreign-licensed ESV network operators within the bilateral agreement process.

#### IV. CONCLUSION

105. The proposed licensing procedures described above for Ku-band ESVs and our two approaches to licensing C-band ESV operations reflect our interest in providing regulatory certainty to both terrestrial fixed service (FS) and fixed satellite service (FSS) operators in these frequency bands. The proposals set forth in this *Notice* are designed to: 1) protect existing terrestrial FS and FSS operations from harmful interference that may be caused by ESVs; 2) allow for future growth of FS and FSS networks; and 3) promote more efficient use of the spectrum by permitting new uses of the bands by ESVs, thereby enabling important new communications services to be provided to consumers on board vessels. We seek comment on each of the matters set forth above.

#### V. PROCEDURAL MATTERS

##### A. Ex Parte Presentations

106. This proceeding shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's ex parte rules.<sup>172</sup> Persons making oral ex parte presentations are reminded that memoranda summarizing the presentations must contain summaries of the substance of the presentations and not merely a listing of the subjects discussed. More than a one or two sentence description of the views and arguments presented is generally required.<sup>173</sup> Other rules pertaining to oral and written presentations are set forth in Section 1.1206(b) of the Commission's rules as well.

##### B. Initial Regulatory Flexibility Analysis

107. Pursuant to the Regulatory Flexibility Act (RFA),<sup>174</sup> the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities by the policies and actions considered in this Notice. The text of the IRFA is set forth in Appendix B. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the Notice as provided in paragraph 56 below. The Commission will send a copy of the Notice, including the IRFA, to the Chief

(Continued from previous page)

24094 (1997) (*DISCO II*). In *DISCO II*, the Commission set forth the public interest analysis applicable in evaluating applications to use non-U.S. licensed space stations to provide satellite service in the United States. See *New Skies Satellite, N.V., Petition for Declaratory Ruling*, Order, 16 FCC Rcd 6740, ¶2 (2001) for a full discussion of the *DISCO II* analysis.

<sup>172</sup> 47 C.F.R. §§ 1.1200, 1.1206; *Amendment of 47 C.F.R. § 1.1200 et seq. Concerning Ex Parte Presentations in Commission Proceedings*, GC Docket No. 95-21, Report and Order, 12 FCC Rcd 7348 (1997).

<sup>173</sup> 47 C.F.R. § 1.1206(b)(2).

<sup>174</sup> See 5 U.S.C. § 603. The RFA, see U.S.C. § 601 et seq., has been amended by the Contract with America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

Counsel for Advocacy of the Small Business Administration.<sup>175</sup>

### C. Initial Paperwork Reduction Act of 1995 Analysis

108. This Notice of Proposed Rulemaking contains either proposed and/or modified information collections. As part of its continuing effort to reduce paperwork burdens, we invite the general public and the Office of Management and Budget (OMB) to take this opportunity to comment on the information collections contained in this Notice, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. Public and agency comments are due at the same time as other comments on this Notice; OMB comments are due 60 days from date of publication of this Notice in the Federal Register.

### D. Comment Filing Procedures

109. Pursuant to Sections 1.415 and 1.419 of the Commission's rules, 47 C.F.R. § 1.415, 1.419, interested parties may file comments in response to this Notice no later than on or before **[30 days after Federal Register publication]**. Reply comments to these comments may be filed no later than on or before **[45 days after Federal Register publication]**. All pleadings are to reference IB Docket No. 02-10. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS) or by filing paper copies. Parties are strongly encouraged to file electronically. See Electronic Filing of Documents in Rulemaking Proceedings, 63 Fed. Reg. 24,121 (1998).

110. Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/e-file/ecfs.html>. Parties should transmit one copy of their comments to the docket in the caption of this rulemaking. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to [ecfs@fcc.gov](mailto:ecfs@fcc.gov) and should include the following words in the body of the message, "get form <your e-mail address>." A sample form and directions will be sent in reply.

111. Because of recent mail delivery issues, parties are urged to file electronically. However, parties choosing to file by paper must file an original and four copies of each filing in IB Docket No. 02-10. Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail.

112. Parties who choose to file by paper must file an original and four copies of each filing. Each filing should also include an electronic version of the comments filed. If more than one docket or rulemaking number appears in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rulemaking number. Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). The Commission's mail contractor, Vistronix, Inc. will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, N.E., Suite 110, Washington, D.C. 20002. The filing hours at this location are 8:00 a.m. to 7:00p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743. U.S. Postal Service first-class mail, Express Mail, and

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<sup>175</sup> 5 U.S.C. § 603(a).

Priority Mail should be addressed to 445 12<sup>th</sup> Street, S.W., Washington, D.C. 20554. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

113. Comments submitted on diskette should be on a 3.5 inch diskette formatted in an IBM-compatible format using Word for Windows or compatible software. The diskette should be clearly labeled with the commenter's name, proceeding (including the docket number, in this case, IB Docket No. 02-10), type of pleading (comment or reply comment), date of submission, and the name of the electronic file on the diskette. The label should also include the following phrase "Disk Copy - Not an Original." Each diskette should contain only one party's pleadings, preferably in a single electronic file.

114. All parties must file one copy of each pleading electronically or by paper to each of the following: (1) The Commission's duplicating contractor, Qualex International, 445 12<sup>th</sup> Street, S.W., Room CY-B402, Washington, D.C. 20554; e-mail: [qualexint@aol.com](mailto:qualexint@aol.com); facsimile: (202) 863-2898; phone (202) 863-2893. (2) Belinda Nixon, Attorney, Policy Division, International Bureau, 445 12<sup>th</sup> Street, S.W., Washington, D.C. 20554; e-mail [Belinda.Nixon@fcc.gov](mailto:Belinda.Nixon@fcc.gov).

115. Comments and reply comments and any other filed documents in this matter may be obtained from Qualex International, in person at 445 12<sup>th</sup> Street, S.W., Room CY-B402, Washington, D.C. 20554, via telephone at (202) 863-2893, via facsimile at (202) 863-2898, or via e-mail at [qualexint@aol.com](mailto:qualexint@aol.com). The pleadings will be also available for public inspection and copying during regular business hours in the FCC Reference Information Center, Room CY-A257, 445 Twelfth Street, S.W., Washington, D.C. 20554 and through the Commission's Electronic Filing System (ECFS) accessible on the Commission's World Wide Website, [www.fcc.gov](http://www.fcc.gov).

116. Comments and reply comments must include a short and concise summary of the substantive arguments raised in the pleading. Comments and reply comments must also comply with Section 1.49 and all other applicable sections of the Commission's rules.<sup>176</sup> All parties are encouraged to utilize a table of contents, to include the name of the filing party and the date of the filing on each page of their comments' length of their submission. We also strongly encourage that parties track the organization set forth in this Notice in order to facilitate our internal review process.

117. Written comments by the public on the proposed and/or modified information collections are due the same day that comments on the Notice of Proposed Rulemaking are due. Written comments must be submitted by the Office of Management and Budget (OMB) on the proposed and/or modified information collections on or before 60 days after the date of publication in the Federal Register of the Notice of Proposed Rulemaking. In addition to filing comments with the Secretary, Marlene H. Dortch, a copy of any comments on the information collection(s) contained herein should be submitted to Kim A. Johnson, OMB Desk Officer, Room 10236 NEOB, 725 17th Street, N.W., Washington, DC 20503 or via the Internet to [Kim\\_A\\_Johnson@omb.eop.gov](mailto:Kim_A_Johnson@omb.eop.gov).

118. Commenters who file information that they believe is proprietary may request confidential treatment pursuant to Section 0.459 of the Commission's rules. Commenters should file both their original comments for which they request confidentiality and redacted comments, along with their request for confidential treatment. Commenters should not file proprietary information electronically. See Examination of Current Policy Concerning the Treatment of Confidential Information Submitted to the Commission, Report and Order, 13 FCC Rcd 24816 (1998), Order on Reconsideration, 14 FCC Rcd 20128 (1999). Even if the Commission grants confidential treatment, information that does not fall

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<sup>176</sup> 47 C.F.R. § 1.49.

within a specific exemption pursuant to the Freedom of Information Act (FOIA) must be publicly disclosed pursuant to an appropriate request. *See* 47 C.F.R. § 0.461; 5 U.S.C. § 552. We note that the Commission may grant requests for confidential treatment either conditionally or unconditionally. As such, we note that the Commission has the discretion to release information on public interest grounds that does fall within the scope of a FOIA exemption.

#### **E. Further Information**


119. For further information regarding this proceeding, contact Belinda Nixon, Attorney, Policy Division, International Bureau at (202) 418-1460. Information regarding this proceeding and others may also be found on the Commission's website at [www.fcc.gov](http://www.fcc.gov).

#### **VI. ORDERING CLAUSES**

120. Accordingly, IT IS ORDERED that pursuant to the authority contained in Sections 1, 4(i), 4(j), 7(a), 301, 303(c), 303(f), 303(g), 303(r), 303(y), and 308 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 151, 154(i), 154(j), 157(a), 301, 303(c), 303(f), 303(g), 303(r), 303(y), 308, this Notice of Proposed Rulemaking IS ADOPTED.

121. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center shall send a copy of this NOTICE OF PROPOSED RULEMAKING, including the initial regulatory flexibility analysis, to the Chief Counsel for Advocacy of the Small Business Administration, in accordance with Section 603(a) of the Regulatory Flexibility Act, 5 U.S.C. § 601, et seq. (1981).

FEDERAL COMMUNICATIONS COMMISSION



Marlene H. Dortch  
Secretary